RAILROAD GAZETTE

A JOURNAL OF TRANSPORTATION.

VOL. XIV.—NO. 10. FIRST QUARTO VOLUME. | CHICAGO, SATURDAY, JUNE 4, 1870. | $3 per Annum, IN ADVANCE.

PUBLICATION OFFICE, 99 & 101 WASHINGTON STREET, CHICAGO.

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GAS GENERATOR FOR PASSENGER CARS.

Dr. Joseph S. Wood, of Philadelphia, has lately invented a very compact attachment for railroad passenger cars designed to generate carburetted hydrogen for illuminating purposes. Though the patent was obtained no longer ago than last April, several of the machines are already being tested on the Erie road and are furnishing such satisfactory results in point of economy and convenience as to attract considerable attention.

The generator consists of two cylinders, one above the other, held by means of wrought-iron bands, in a transverse horizontal position to the centre of the car, as shown in the engraving. The length of the cylinders is about the same as the width of the car. The upper cylinder or carburetting tube is six or eight inches in diameter, and is packed with sponge or "excelsior" and filled nearly full with gasoline. The lower cylinder, from fifteen to twenty inches in diameter, contains two compartments one above the other. The upper compartment is filled with sulphuric acid diluted in the proportion of one gallon of water to one pound of acid. The lower compartment contains two perforated tubes, as shown in figure 3, the outer one being connected with and opening through the head of the cylinder. The inner perforated tube is unconnected, and, on unscrewing the cap shown in figure 2, may be removed and filled with iron filings and returned to its place. A connecting pipe with an adjustable cut-off, shown on the left side of figures 2 and 3, joins the upper and lower compartments. When this passage is left open the dilute sulphuric acid passes into the lower compartment, and, coming into contact with the iron, generates hydrogen gas, which passes up through connecting pipes into the gasoline tube where it is carburetted and passes through pipes in the cars to the burners. As long as the gas is being consumed in the car the dilute acid will pass down automatically into the lower chamber, but when the gas is turned off in the car the pressure of gas in the cylinder forces all the dilute acid in the lower compartment back into the upper chamber and the generation of gas ceases.

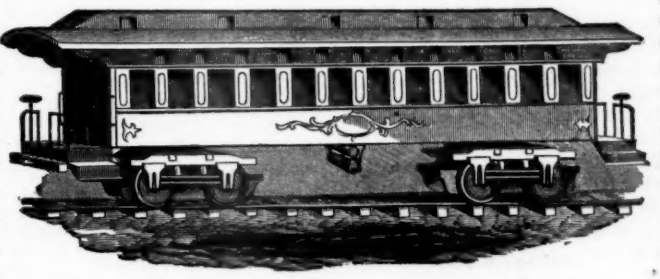

Fig. 2. *Fig. 3.*

Gas Generator for Passenger Cars.

Mr. Ezra Cuyler, general agent for the invention, is now in this city superintending the construction of one of the machines intended for the Directors' Car on the Chicago & Northwestern Railway. When charged, this machine will furnish sufficient gas for four burners for fifteen hours—more than will probably ever be needed at any one time.

Mr. Kellogg, of the Phœnixville Iron Works, is also interested in the patent, and his extensive acquaintance with railroad managers will probably assist materially in its introduction.

Further information may be obtained of Dr. Joseph S. Wood, No. 50 North Tenth street, or John J. Carberry, No. 925 Race street, Philadelphia.

A COMPANY has been organized in St. Louis with a capital of $5,000,000 for the purpose of establishing and operating works for the manufacture of steel rails and pig iron to be known as the Ætna Rail and Iron Works. The works are to be built on the grounds of the Kingsland Iron Company, just south of St. Louis. They are to cost nearly a million of dollars.

Contributions.

HINTS ON TRACK REPAIRS.

BY WILLIAM S. HUNTINGTON.

DRAWING SPIKES.

The various operations connected with track repairs necessitate the drawing of a great many spikes, which operation is usually very carelessly performed. The heads are pulled off or the spike is bent so that it cannot be driven again, and a new one must take its place. A great many tons of spikes are yearly wasted by carelessness in drawing and by bad handling after being drawn. Claw-bars are usually made in very bad shape, so that it is impossible to draw a spike with them without spoiling it for future use. The claws should be so made as to take no hold of the point of the head (which is not generally the case), else the head is either broken entirely off, or it is bent so that it is unfit for use. By making the claws of proper shape, all the force applied to the spike in drawing it will come in a line with the body of the spike, so that it can be drawn straight. Some spikes are of bad shape to draw in good condition for future use, but with a claw-bar of the proper form, and care in drawing, a great many spikes can be saved for future use.

There are a great many kinds of claw-bars in use, some of which work well, and there are several kinds of patent bars for pulling spikes which are said to work well, but for some reason they have not come into general use; and probably the old style of "bull's-foot" claw is as good as any if properly made. It is, however, a difficult job to make a good claw-bar, and as it is an implement which is in almost constant use, it should be rightly made and used. Sometimes even a good claw-bar is badly used, and spikes are broken, bent and twisted needlessly. A good bar must be rightly handled, or it will not draw spikes without bending them. None but a good one should be used, and that used carefully. A great many spikes are broken and destroyed needlessly, by attempting to draw them in winter when the ties are frozen solid, and when they cannot be drawn by any claw-bar without breaking. There is a vast amount of labor performed by repair men that results in no good to the track or profit to the company; in fact, there is much work done that is an injury rather than a benefit, not only wasting the time and labor, but destroying property in place of saving it or keeping it from wear. One way of wasting time and destroying property is in drawing spikes for repairs when they are not needed. Track men have a great desire to be busy, *especially about train time*, and they frequently draw spikes for shimming when it is not necessary, as, in severe cold weather, when not one spike in ten can be drawn without breaking. Of course they must be replaced with new ones, which are expensive. Every railroad company is paying out large sums of money for spikes, a great part of which may be saved by paying a little attention to the matter. If it is necessary to shim, it can be done in mild weather, when the spikes can be drawn without breaking. Not only spikes, but chairs, bolts, etc., and not unfrequently bars, hammers and other tools are broken by careless use in frosty weather, and it would be better for the company to pay the men for sitting by the fire, than to have this kind of work done at such times. Those who furnish material for track repairs, and have not given this matter special attention, would be surprised at the amount of money that can be saved by exercising more care in this seemingly unimportant matter. There are other ways of destroying a great deal of this kind of property, and it is singular that its practice is allowed to such an extent as it is. Some of the best managed roads in the country have their spike account increased hundreds or thousands of dollars yearly by the slashing, tearing, ripping style of doing work some track men have. It is frequently too much trouble to draw spikes, and they are driven into the tie out of the way, being hammered until the head breaks off, when one more blow sinks it out of sight. This operation is sometimes performed to such an extent that a half dozen or more spikes are jammed into a single tie, resulting in the loss of so many spikes and the injury to the tie, which is by no means trifling. Sometimes a chisel-pointed crow-bar is used to force spikes from the rail. By placing the bar perpendicular and by using the rail as a fulcrum, the spike is bent sufficiently to allow the removal of the rail, when shifting iron; and when another rail is put in its place, the spikes are driven up to the rail and left in this condition. Old hands frequently do this, and there are miles of track served in this manner, with only a portion of the spikes taking any hold of the rail. Track left in this condition is not safe and it has often been the cause of trouble of a serious nature. This matter is well worthy the attention of railway managers, and it is singular that a matter of so much importance is so generally overlooked.

SHIMMING TRACK.

In winter, when ballast is frozen so that track cannot be surfaced by tamping, it is done by *shimming*, which operation is many times done in a shiftless manner, and many first-class accidents have happened on track shimmed badly. If shimming is well done, it is one of the nicest and most important operations connected with track repairs When properly done, it prevents wear of iron and rolling stock to a greater extent than any other operation consuming the same amount of labor. It is the practice with some section men, to make shims out of blocks of wood that have fallen from the tender, or have been thrown overboard by firemen when too large for their use, and sometimes they split off a piece from the end of a tie, make a wedge with a dull hatchet, drive it under the rail, and cobble it up in such a manner that it will roll and rack in a frightful manner under a passing train. Track is sometimes raised on shims of considerable thickness so that the spikes scarcely enter the tie, and after a few trains have passed the spikes will not touch the rail, as every vibration of the rail forces the spike from it, where it remains. This is very unsafe. These shims frequently get loose and work out from under the rail, and a great deal of iron is ruined by being bent in the surface from this cause. Rails may frequently be found with no support for several feet, the shims having worked out, and the rail becomes so bent that it cannot be straightened without heating. It is not uncommon to see track men go along the road, pick up the shims that have worked out, and slip them under the rail, when, if the rail has

been sufficiently sprung in the surface, it may hold it for a short time; but it will soon leave its place, and then it may be necessary to hew off a little before it will go under the rail, owing to its being bent. In this manner track that has been raised on shims three inches thick will soon come down to half that thickness, by reason of the bending of the rail when the shims are out, and the cutting of them down before they can be replaced. This kind of work is practiced to a far greater extent than is generally supposed, and there is hardly any road master but can find some bad shimming on his road, if he looks closely at the matter.

A good deal of labor is wasted when frost has left or is leaving the track, at the close of the winter, by removing shims that would better remain under the rail. Of course much shimming is rendered necessary by track being thrown or heaved out of surface by the action of frost, and when the frost leaves, it is necessary to remove the shims. In fact this should be a busy time for section men, where much shimming has been done, as it is often dangerous to let shims remain after the track has settled to its bearing when the frost is fairly out. It has formerly been the practice on all roads, to shim only when track could not be tamped on account of frost; but it is now the custom on some roads to shim in summer, when it requires but slight raising to put the track in good surface. This is a good plan and should be practiced on all roads, as no doubt it will be when once its advantages become known. Where joints are down but a trifle and the ties have settled to a good bearing, it disturbs ballast to tamp it, and, if rains occur soon after tamping, the track is likely to settle out of surface again very soon; whereas if a shim was placed under the rail, it would remain in good surface a long time On looking at the surface of track, it may appear to be all right, when, on a close examination of the joint ties, they will be found a trifle loose—just enough so to expose the ends of the rails to the pounding action of wheels, by which the iron is soon spoiled. It is better to shim such a joint than to tamp it, even in summer. A great deal of track is shimmed in winter that settles into first-rate surface in the spring, with the shims remaining in the track, but it is the practice of section men to remove the shims and raise the ties to the rail and tamp them. This should never be done, for it is worse than throwing away labor; as the labor must be paid for, the track is not in as good condition as it was before the removal of the shims, and a frequent tamping is necessary to keep the track in good surface, when if the shims had been allowed to remain, no labor would have been required. Of course shimming should be well done when it is allowed to remain, and not cobbled up on round sticks or wedges, as is often the case.

When a shim of considerable thickness is required, it should be spiked to the tie and other spikes driven through the shim in the manner of spiking when no shim is used; otherwise the track may spread and cause mischief, especially on curves. Shims should be prepared by machinery, of hard wood, and of various thicknesses, bored for the spikes, and when used the tie should be adzed off smoothly so that the shim may have a good bearing. When shimming on ties that have been in the track for a considerable time, they will be found to be good under the rail, and, unless the groove is adzed out, the shim will break and the portion under the rail will settle into the groove and thus materially alter the surface of the track. When track men are oblige to furnish their own shims they make them out of any material they get hold of, sometimes out of a pine board knocked off the fence, or a block cut from a cedar fence post, or something of the kind which is worthless for the purpose, and it is for the interest of railroad companies to furnish shims ready for use and see that they are properly used.

Joints are often shimmed in winter when they do not really need it, as it is often the case that a joint may be considerably down and at the same time the ends of the rails lay perfectly solid in the chairs. In such cases it is better not to disturb it in frosty weather, as the iron is not subjected to unusual wears, and the loss from breakage will overbalance any benefit than can be derived from shimming.

In regard to making shims by machinery, it is not necessary that any expensive apparatus be employed, as any ordinary car or repair shop is supplied with all necessary appliances for making shims to good advantage, and one man can make more shims and make better ones in a day, in any ordinary repair shop, than a whole gang of section men can hew and hack out in twice that time. By taking good hard timber and sawing it into proper lengths and width for shims, it can readily be sawed into shims of various thicknesses and packed into boxes to be sent where they are needed. Where many shims are used it will pay to rig a boring apparatus especially for that purpose. This can be done with very little expense in any shop by arranging two pits of the proper size in position to bore both holes at one operation. It is best to bore the blocks before sawing them into shims. New roads which have not got their shops in operation, or short lines which have no extensive shops, affording facilities for making shims, had better hire them made at some private shop. This will pay, and any company that is a little short for means can economize by having their shims made in this way.

CREEPING OF RAILROAD TRACK.

To the Editor of the Railroad Gazette.

The statements of a correspondent in your issue of May 21, I think, do not say all that should be said about the creeping of rails, and I believe that experience shows most fully that two spikes driven in niches at the center of each rail will not prevent the rail from creeping.

On the Hartford & New Haven Railroad, nearly three years ago, some 1,500 tons of new rails were laid, and on one side of the flange of each of these rails niches were punched every two feet for the spikes.

In some cases, however, it has been found that with a heavy and fast traffic, rails fastened even thus closely will cut into the spikes very badly and will not move the tie at all.

I believe experience will show that this creeping is greatest when the rails are light and lie closely on the ties, and that on double-track roads it will always take place in the direction of the traffic, except perhaps on steep grades.

It would seem for this reason to be caused almost wholly by the hammering of the wheels against the ends of the rails, and hence when the rails lie loosely on chairs and on the ties, the creeping is excessive. This is shown to be the chief cause also by the fact that where the joints are tight and the rails are held snug to the ties, the creeping is but a mere trifle.

It would not be wise for me to give you the name of an old double-track road on which in a distance of six miles, which was most critically examined a few months ago more than twenty per cent. of the rail-joints had been moved by this creeping a distance of more than one inch from the center of the chairs, the rails in every case cutting into and bending the spikes and in several instances forcing them loose entirely. At one joint in this space of six miles the end of the rail which took the hammering of the wheels had been pushed *entirely off the chair* and had *no support whatever nearer than the next tie*, a distance of 14 inches, and that, too, on a road carrying 1,000 passengers and passing about 100 freight cars daily. Surely rails and rail joints are "more sinned against than sinning."

Rock Island, Ill., May 26. P. Barnes, Jr.

Contributory Negligence.

In a recent case decided by the Missouri Supreme Court (Morrissey *vs.* The Wiggins Ferry Company, 43 Mo. 380) the Court laid down the law of contributory negligence and the responsibility of carriers as follows:

That there is a difference in the adjudications upon this subject, and that some courts have held that no recovery can be had where the injured party is in the least in fault, cannot be disputed. But such is not the ruling of this Court; and it is to be observed that the courts which have heretofore laid down the above doctrine are rapidly retracing their steps and declaring a rule more reasonable and in consonance with justice.

The question has been discussed in several recent cases in this Court, and the law must be considered as established—no longer in doubt or open to question. The settled principle now is that it ought to be left to the jury to say whether, notwithstanding the imprudence of the injured person, the defendant could, in the exercise of reasonable diligence, have prevented the catastrophe.

The degree of responsibility to which carriers of passengers are subjected is not ordinary care merely, which will make them liable only for ordinary neglect, but extraordinary care, which renders them liable for slight neglect.

In a recent case in this Court, in discussing the liability of passenger carriers, we declared the rule to be "that the carrier shall be guilty of some negligence which mediately or immediately produced or enhanced the injury, and that passengers should not have been guilty of any carelessness or imprudence which directly contributed to the injury, since no one can recover for any injury of which his own negligence was, in whole or in part, the proximate cause; and, that although the plaintiff's misconduct may have contributed remotely to the injury, if the defendant's misconduct was the immediate cause of it, and with the exercise of prudence he might have prevented it, he is not excused." (Huelsenkamp *vs.* Citizens' Railway Co., 37 Mo, 537: Kennedy *vs.* N. M. R. R. Co., 36 Mo. 351.)

The concluding paragraph of defendant's second instruction is objectionable. It tells the jury that unless the jury believe that the accident and death resulted without any negligence or want of care on the part of Annie, which produced or contributed to produce such accident or death, then they should find for the defendant.

This was in direct conflict with the law as above declared. It destroyed the plaintiff's right of action, for the least fault on the part of deceased, and exonerated the defendant, although the unskilfulness, negligence and criminal intent of its agents and employes may have directly caused the injury. Such is not the law and we hope it never will be.

The plaintiff asked two instructions which were refused. They are as follows:

"That if the jury find from the evidence that the employes of defendant or either of them were guilty of negligence in not keeping the entrance to defendant's boat properly guarded and protected, or in not keeping sufficient lights on said boat or on the wharf-boat, by reason of which deceased came to her death, and that deceased was not guilty of any want of any ordinary care and prudence which directly contributed to the injury, than the defendant is liable in this suit."

"That although the deceased may have been guilty of misconduct or failed to exercise ordinary care and prudence while passenger on defendant's boat,, which may have contributed remotely to the death of the deceased, yet if the employes or either of them of defendant were guilty of negligence which was the immediate cause of the death, and with the exercise of prudence by said employes or either of them said injury and death might have been prevented, the defendant is liable in this suit."

The instructions asserted correct propositions of Law, and should have been given. They tell the jury that if the deceased only remotely contributed to the accident, and if the agents and employes of the defendant were the direct and immediate cause, and might have prevented it by the exercise of prudence and care, the defendant is liable. Nothing can be clearer.

Steam on the Canals.

The necessity of reducing the time consumed in the round trip of the canals has long been sensibly felt. Many experiments have been made, and much money expended, but as yet no plan with steam as a motive power has come into general use. Some ten or twelve years ago steam canal boats were built and run with greater or less success. In fact those who had considerable experience with such boats at that time are still sanguine that they would have been successful had the right of way been continued to them. Thir final disappearance from the canals is attributed to the delays which occurred at the locks in waiting for their turn. The expense of keeping up steam, while a dozen or twenty boats that had arrived before them were being locked through, more than counterbalanced the saving in time.

A glance at the business done by some of the steamers referred to would seem to justify such a conclusion. The steamer *D. Gazley* made regular trips from Buffalo to New York in eight days, which is a little more than half the time usually taken. The *Chas. Wack* made the run from Troy to Buffalo with fifty tons of freight in four days. The *Sternberg*, with a full load of grain, went from Buffalo to Rochester, a distance of ninety miles, in twenty-four hours. She also made the same distance, with a full load and the loaded boat *Seneca* in tow, in thirty-six hours. The *Seymour* run from Buffalo to Albany with eleven hundred barrels of flour, unloaded and returned to her dock in this city in eleven days. This time was made when the steamers were allowed, upon paying the additional tolls, to pass through the locks without delay. The horse boat-men, however, soon became dissatisfied with this state of affairs, and the right-of-way privilege was revoked. Several of the boats named above are now successfully running on canals not any larger than the Erie, but where they have the right-of-way at the locks.

The question of steam on the canals is again being agitated. In the last Legislature two bills were passed authorizing the introduction of steam towage upon the canals. One of the plans is the so-called European system, now in use in Belgium, involving a submerged cable line with pully attachment to boats by which, it is claimed, they can be propelled at the rate of three and a half to four miles an hour. The other plan is that of suspended cables, with pulley attachments to boats, etc. The bills passed authorize parties interested to make trials of their respective systems, at their own expense, under the direction of the Canal Board. It is to be hoped that something will come from the experiments.

The Buffalo Board of Trade also took action in a similar direction at its session yesterday. A committee was appointed to confer with practical builders and others in relation to a plan for an improved canal boat. The improvement now most needed is an increase of speed; we would recommend that the committee give their attention to the power as well as the construction of the boat itself. Increased speed is what we want and must have to enable our canals to compete successfully with the railway.—*Buffalo Commercial Advertiser.*

Railroads in New Jersey.

Frequenters of summer resorts in New Jersey will soon have new fields open for enjoyment, through increased railroad facilities. The New Jersey Southern Railroad Company, lately the Raritan & Delaware Bay Railroad Company, purpose connecting directly with Camden by the 1st of July, and are grading a track from Whitney's Mills, four miles below Manchester, and seventy-one miles from this city, to that point, by way of Pemberton.

The injunction of the Camden & Amboy Railroad upon the New Jersey Southern, between Atsion and Jackson, on the Camden & Atlantic road, has been removed, and some time during this year measures will be taken to construct a direct road from thence to Vineland, from which point a road will run direct to Cape May. A railroad is now surveying between Barnegat and Watertown, passing Mannahawkin, West Creek and Tuckerton. It will open many fertile tracts, and afford quick access to the rich fisheries of Little Egg Harbor Bay. It is to be finished, probably, by next summer.

Another road from Tom's River to Barnegat will afford a complete connection with both the New Jersey Southern and Seashore roads. A new railroad is likewise in contemplation between Hightstown, on the Camden & Amboy road, and Port Monmouth, which will give travelers more speedy access to New York than by the way of South Amboy, and open up a large tract of country.—*American Railroad Journal.*

THE PACIFIC MAIL STEAMSHIP COMPANY.

Official Exhibit of its Assets and Liabilities.

At a special meeting of the directors of this company on the 26th ult., a committee appointed for the purpose submitted the following:

To the Board of Directors:

The undersigned committee, appointed by the Board of Directors to prepare a statement upon the affairs of the company, beg leave respectfully to submit the following, showing the company's assets and liabilities, viz.:

ASSETS.

Cash on hand and call loans		$313,420 92
Time loans		263,599 06
INVESTMENTS:		
$300,000 U. S. 5-20s cost	$293,237 50	
250,000 U. S. 10-40s cost	274,750 00	
27,149 shares P. M. S. S. stock	2,714,900 00	
3,063 shares Panama Railroad stock at $150	459,450 00—	3,673,337 50
Cash in hands of agents and pursers		90,785 82
Coal, 63,050 tons		1,231,560 62
Outfits and supplies		297,444 97
REAL ESTATE:		
San Francisco, including wharf and franchise	932,269 51	
Warehouses, San Francisco	127,530 78	
1,668 shares F. F. Dry Dock	100,331 99	
Benecia	26,334 50	
Oregon	2,367 75	
San Diego	1,215 00	
Hong Kong, with wharf, godowns, &c.	161,221 76	
Yokohama, with godowns and coal sheds	69,317 97	
Hiogo	991 34	
Taboga Water Works, &c	40,000 00	
Islands (Bay of Panama)	25,000 00	
Aspinwall Iron Wharf, house, warehouses, &c	350,677 94	
Canal street wharf	25,000 00	
Spring street wharf	10,000 00—	$1,874,252 54
STEAMERS:		
Colorado	750,000 00	
Sacramento	600,000 00	
Constitution	600,000 00	
Henry Chauncey	600,000 00	
Arizona	600,000 00	
Rising Star	600,000 00	
Montana	600,000 00	
New York	600,000 00	
Costa Rica	400,000 00	
Ocean Queen	300,000 00	
Golden Age	300,000 00	
St. Louis	75,000 00	
Northern Light	75,000 00	
Ariel	75,000 00	
Clara Clarita	30,000 00	
Sonora	20,000 00	
Taboga	15,000 00	
America	1,017,942 23	
Great Republic	1,058,234 72	
Japan	1,049,434 72	
China	1,006,282 42	
Alaska	964,138 39	
Oregonian	500,000 00	
Ancon	167,502 13 —$11,983,534 60	
Lighters		101,799 83
STEAMERS:		
Ocean Queen and Rising Star voyages not yet completed		26,618 93
Unsettled accounts with connecting steamship companies, &c		39,652 22
Balance to debit of profit and loss		212,338 55
Total		$20,094,245 26

LIABILITIES.

Capital stock	$20,000,000 00
Unsettled accounts with agents and pursers	84,711 69
Freights on coal in transitu	10,784 80
Freight insurance account	750 77
Total	$20,096,245 26

The steamers have been well kept up by repairs as needed, the same being charged to current expenses; they are valued below their original cost, and the same as at the date of the last statement presented to you, May, 1869, when they were all, either in actual service or reserve, profitably employed.

The steamers are now employed as follows:

The "Alaska," "Henry Chauncey" and "Arizona" are running twice a month between New York and Aspinwall, two being in commission and one in reserve.

The "Constitution," "Colorado," "Sacramento" and "Montana," three in commission and one in reserve, twice a month, between Panama and San Francisco.

The "Great Republic," "China," "Japan" and "America," three in commission and one in reserve, once a month, between San Francisco and Hong Kong.

The "Costa Rica," "New York," "Oregonian," "Golden Age" and "Ariel," four in commission and one in reserve, four times a month between Yokohama and Shanghai.

The "St. Louis," as for several years past, is stationed at Panama as a spare ship.

The "Ocean Queen" and "Rising Star," thrown out of employment by the reduction of the Aspinwall line, have been placed temporarily in the European trade.

The "Northern Light" is worth to the company only what she will break up for.

The "Ancom" and "Taboga" are used as tugs in the Bay of Panama.

The "Golden City" was totally lost February 22. She has been written off the books. The amount at which she was valued, $650,000, has been carried to the debit of profit and loss.

INVESTMENTS.

The 3,063 shares of Panama Railroad Company's stock is valued on the books at $459,450, being at the rate of $150 per share.

The 27,159 shares of its own stock, owned by the Company, stand on the books at par, being also a liability for the same amount.

The loans and securities are perfectly good.

All our other property (such as real estate, warehouses, wharves, &c.,) is in good condition.

The property in Japan and China is admirably adapted to our business, present and prospective, and fully worth the valuation given; so likewise that at San Francisco, which includes a commodious wharf of 700 feet in length, with a valuable exclusive State franchise for about twenty-four years; three large bonded warehouses, from which income is derived; also, 1,668 shares of the San Francisco Dry Dock, from which dividends are received.

The coal on hand, 63,000 tons, stands at less than cost.

The Committee find that at this time last year, the date of the last published statement, the company was employing four steamers per month on the route between New York and San Francisco, *via* the Panama Isthmus, and earning and paying to the stockholders therefrom a reasonable return on the capital invested. This service has been reduced to two steamers per month, and has ceased, for the time being, to be profitable.

This falling off in the Panama business has been mainly caused by the general commercial depression, and by construction of the Pacific Railroads; on the other hand, it is a reasonable expectation to indulge that the China branch of the service will be greatly benefitted by the operations of the same railway route, in encouraging immigration, supplying markets, developing and stimulating production, and providing by rail the means of transit. The business of the China line, including the Shanghai branch, has continued to improve, meeting every reasonable expectation, and is now earning a return over and above a moderate allowance for depreciation and insurance.

Under a government mail contract for ten years, with a subsidy of $500,000 a year, the first steamer was dispatched from San Francisco for Hong Kong on Tuesday, January 1, 1867. From that day till September departures were made once in three months, thence twice in three months, or six-weekly, till June, 1868, when we began the full monthly service, which has since been regularly maintained.

Each increase of the service, though that of the main line has been trebled, and that of the Shanghai branch augmented six fold, has resulted, after a short time, in an increase of the average business done and in improved rates, while the average expenses have been reduced. We think the time has arrived when the trade demands a semi-monthly line across the Pacific, and the Company is now seeking the assistance of the Government to enable it to provide such increased facilities. Should our efforts prove successful we shall be able to utilize on that route some of our steamers not otherwise employed; future events will have to determine how many steamers can be thus provided for, as well as to the disposition of of any others which may become unemployed.

All of which is respectfully submitted by your Committee.

A. A. Low, Chairman,
WILLIAM DENNISTOUN,
ALLEN MCLEAN, President,
} Committee.

Whereupon on motion—The statement of the Committee was unanimously received and adopted by the Board, and ordered to be published for the benefit of the stockholders. Attest, THEODORE T. JOHNSON, Secretary.

Regulating Railroad Tariffs by Law.

The Constitutional Convention of Illinois is laboring hard to incorporate in the Constitution of that State a remedy for all the evils to which flesh is heir. But perhaps the most radical change which it has yet agreed to is the following provision in relation to Railroad corporations:

SECTION 4. Railways heretofore constructed, or that may hereafter be constructed in this State, are hereby declared public highways, and shall be free to all persons for the transportion of their persons and property thereon, under such regulations as may be prescribed by law, and the General Assembly shall from time to time pass laws establishing reasonable maximum rates of charges for the transportation of passengers and freight on the different railroads in this State, and to enforce such laws by adequate penalties, and may provide for a forfeiture of their property and franchises.

This is all well enough in its way; and if Illinois has all the railroads she wants she can perhaps afford so drastic a remedy for oppressive railroad tariffs. The time will probably come in this country when all railroads will be converted into public highways and run by Legislatures and commissioners. The difficulty about inaugurating such a policy, at present, is that these roads are built by private capital, invested upon certain conditions and under certain guarantees agreed upon between the State and the corporations entrusted with the building and operation of the roads, among which is the right to regulate their own tariffs. But, the railroad corporations having fulfilled their part of the contract, and the stockholders having invested their money on the faith of the rights and privileges granted in the corporation charter, if the State now finds it necessary to the public welfare to repudiate its contract, set aside the "vested rights," as they are called, of the Railroad corporations, and convert the railroad into a public highway, regulated and controlled by the public through the Legislature, justice and public policy both demand that the State should first buy and own the property of which it assumes control. Upon every principle of natural as well as legal right, the ownership and control of property should go together, nor can they be separated without violence to the rights of property, and detriment to the public weal. Railroads cannot be profitably, or even safely owned by private parties, while managed by the State, representing and controlled by adverse interest. For if the public may, through their legislative representatives, regulate freight and passenger tariffs, it is their interest to reduce them as low as possible, or get rid of them altogether, while it is the interest of railroad companies to so adjust their rates as to command the largest share of business, and make the most money for the stockholders. No man will invest his capital in enterprises whose profits will thus be controlled by an adverse interest. The State, therefore, should own the railroads if it undertakes to run them, and owning them, it might then reduce the tariff to the minimum of profits necessary to pay running expenses, and accumulate the sinking fund necessary to pay for the cost of the roads; and find convenient places at tolerable salaries for an army of now placeless politicians. A short experience of this system would soon prove that the remedy was worse than the disease, and that State governments were designed for very different purposes than running railroads. The truth is, the railroad corporations of the country are in a dilemma between the right of the State to control them as public highways, and their own private property, and the State is in a dillemma between the protection it owes the people on the one hand from the oppressive and extortionate exactions of railroad monopolies and combinations, and the chartered privileges which it has recklessly conceded to these corporations as the foundation of their investments, and which have now become vested rights. Nor can we see any issue out of this dilemma consistently with constitutional principles, and with natural equity and good faith on the one hand, and with the requirements of the public weal on the other, except for the State to purchase the railroads, extinguish their charters, and re-grant them to new companies with new charters in which the State shall establish such safeguards and limitations upon the corporate franchises and privileges, and reserve such limited control of the tariffs of the companies as may be demanded by the public interests. Any other course than this seems to involve elements of agragrian violence—which is irreconcileable with the very existence of property. For the present, however, the advantages of railroads in opening new settlements and in enhancing the value of lands and products, so far outweigh in popular estimation all objections on the score of high freights—incident to long lines of rail through a sparsely settled region that it will probably be years before the popular dissatisfaction with railroad monopolies which finds expression in the Illinois Constitutional Convention will reach such a height here as to be ready to discuss the policy we have suggested.—*St. Paul Press, May* 19.

The Article on Corporations in the New Illinois Constitution.

The following comments on the article on corporations in the proposed new constitution of Illinois we take from a longer article in the *Commercial and Financial Chronicle*, whose opinion on this subject has great weight:

"With reference to chartered corporations, the provisions of the new constitution are strict and impartial, and in many respects the recommendations of the Convention are worthy of imitation by similar assemblages in other States. No corporation is to be created by special law, and existing charters under which no organization has been effected are revoked. A general law authorizing the creation of corporations with banking powers must be submitted to the people, and "the suspension of specie payments by banking institutions created by the laws of the State, on their circulation, is never to be allowed or sanctioned." The provisions respecting railroads are published in another column. They will be found to be stringent, and, it is claimed, unfriendly; but, while guaranteeing to such corporations their legal rights in all respects, we do not see that anything more than a judicious care is exercised that they may not entrench upon the rights of the people of the State. Among other things it is provided that no company shall consolidate its stock, property and franchises with those of any other railroad corporation owning a parallel or competing line; and in no case shall any consolidation take place except upon public notice given for at least sixty days to stockholders, in such manner as may be provided by law. No railroad corporation is permitted to issue any stock or bonds except for money, labor or property actually received and applied to the purpose for which such corporation was created; all stock dividends and other fictitious increase of the capital stock or indebtedness of any such corporation shall be illegal and void; and the capital stock of no railroad corporation shall be increased for any purpose except upon giving sixty days public notice to stockholders. The exercise of the power and right of eminent domain shall never be so construed or abridged as to prevent the taking, by the General Assembly, of the property and franchises of incorporated companies already organized, and subjecting them to the public necessity, the same as that of individuals. The Legislature is authorized to enact such laws as may be needed to correct abuses and prevent discrimination and extortion in the rates of freight or fare, and to enforce the same by the imposition of penalties to the extent, if necessary, of a forfeiture of property and franchises. A careful examination of these provisions shows that, while the charter rights of railroad companies are not abridged or restricted, the convention has fully appreciated the danger to be apprehended from the secret movements of directors in consolidating competing lines and watering the capital stock; and to have sought an adequate and effective remedy for these evils in constitutional provisions beyond the reach of the Legislature over which, as experience shows, the railroad companies exercise a practical control. The same is true of the article designed to remedy the abuses of the grain trade at Chicago, by defining the duties of the railroads as common carriers and of the warehouse men as the keepers of public storehouses. It is claimed, and not without reason, that this matter should properly have been left to the Legislature, but since it has become evident that no measure adverse to the interests of the railroad and warehouse rings could be expected to emanate from this source, the action of the convention is wise and timely. The abuses growing out of the coalition between the transportation companies and the warehousemen, of which we spoke at some length in a previous issue, were in their nature so serious and in their consequences so inimical to the interests of legitimate commerce, that extraordinary measures for their correction are fully justified; and the hearty approval expressed by the press and public of the action of the convention in this important particular is sufficient evidence of the wisdom of that body in adopting the article in question.

The *Nation*, of New York, which has given a great deal of attention to questions involving the relations of

corporations to the community, and is, moreover, a most capable critic, has the following comments on the same article:

In the treatment of corporations, the constitution proposes some radical and novel changes. It cannot be alleged that the convention was controlled by railroad companies, for it has assumed not only to confer upon the Legislature the right to establish maximum rates of freight and passenger fare, but to make it an imperative duty to do so. The courts will probably hold that, if the Legislature does not already possess the power to establish such rates of freight and fare on existing railroads, the new constitution cannot confer it. If a railway charter heretofore granted is a contract, no law can be passed impairing its obligation. Indeed, the bill of rights in the instrument under discussion prohibits the passage of such laws, and, if it did not, the United States Constitution certainly does. This objection, however, does not apply as regards railways hereafter constructed, and it remains to be seen whether the new provision will facilitate the construction of new roads. Overissues of stock are prohibited, and all stock dividends, or other fictitious increase of capital stock or indebtedness, declared null and void. It is provided, also, that no stock shall be issued for cash actually paid, except after sixty days public notice. These provisions are of great importance, not only to the *bona-fide* stockholder, but to the morals of the community, and are undoubtedly within the scope of the powers of the constitution. It is provided, further, that in all elections of directors or managers of corporations, each stockholder may vote as many shares as he holds for as many directors as are to be elected, or may multiply the number of his shares by the number of directors, and cast them all for one person, or may distribute them as he chooses. This is extending the principle of minority representation to private corporations, and must be regarded as a healthy reform whether it is legally applicable to existing corporations or not. It is provided, also, that a majority of the directors of all railroad corporations, created by the laws of Illinois, shall be residents and citizens of that State. The common-law principle on this point is that a corporation can have its domicile only in the State where its charter is obtained, but that it may act by its agents in any other State or country whose laws enable it to do so. It is assumed that the directors of a corporation are its agents, and that they may act in Wall street or Lombard street, if authorized so to do by their stockholders. If these principles and assumed principles were the law at the time the charters of the existing railways of Illinois were granted, the provision in question will probably be inoperative upon such corporations. There are undoubtedly many advantages in having railway directors on the ground, in contact with the people whom they serve or govern, as the case may be; but it is also true that non-residents are more likely to send their capital to Illinois, if they are allowed to control it afterward, than if they are compelled to entrust it wholly to the management of strangers.

The New York *World* says, on the same subject:

These provisions are admirably adapted to the end sought, and will be of interest to Eastern stockholders. It will, however, be a novel feature if capital shall cease to control the subject of its investments because of legislative enactments, and we doubt whether the intention in respect to the place of transfers of stock will be successfully carried out.

Rumors and Speculations.

The *Stockholder*, of New York, which is sure to tell all the startling news, about a year ago announced that a combination of railroad companies west of Chicago was about to build a new air line railroad between Chicago and New York, especially for the benefit of the roads in the combination, and now explains very clearly why the plan is abandoned:

This paper mentioned, four weeks since, what all of its contemporaries had failed to notice, that the holding of the stock of the great Chicago & Northwestern Railroad Company is such that Mr. Tracy, now President of the Chicago, Rock Island & Pacific Company, will be elected President of the Northwestern Company at the annual election next month. This new alliance of the Northwestern and the Rock Island companies imports the dissolution of the compact, indicated by joint Presidency, etc., hitherto maintained between the former company and the other great Northwestern railroad corporation, the Milwaukee & St. Paul.

We are led to suspect that the change, soon to be visible, in the control of the Northwestern Company's lines has another probable significance which is entitled to attention from those concerned in the stock market. It is not unlikely that the Vanderbilt interests have stimulated, if they have not taken direct part in the movements which have changed (or soon are to change) the direction of the Northwest company. We have been aware that the railway companies whose terminus is at Chicago, have long been impatient under the control, almost with the effect of monopoly, which Mr. Vanderbilt's companies and their connections were persistently acquiring with respect to the traffic between Chicago and the seaboard. The term monopoly is well used, since the great Pennsylvania company, Mr. Vanderbilt's rival in respect to securing connections and other minor issues, is quite at one with him in the policy of taxing without stint the traffic east from Chicago. The companies which furnish this traffic, notably the Northwestern lines, the Milwaukee & St. Paul lines, the Illinois Central, and the Rock Island, have discussed with more or less directness the plan of building and controlling a through line from Chicago to New York—no unlikely enterprise in their hands, if they could be united for the work, since they originate three-fourths of the traffic eastward, the chief direction for heavy freight, between those two cities.

The life of this plan we have reason to know was in the alliance, soon to be sundered, of the Northwestern and the Milwaukee & St. Paul roads. The Illinois Central was a passive ally in the plan. The Rock Island, the weak spot in the quadruple arrangement, was hardly consulted. In confederation with Rock Island, therefore, it is likely that Mr. Vanderbilt's party have captured Northwestern and thus dispersed the clouds in that quarter which threatened the Vanderbilt property.

It will doubtless follow, if our conjectures be correct, that Mr. Vanderbilt's treatment in watering stocks and compelling the traffic over the roads to pay dividends on the nominal capital thus written into life will be extended still farther westward, to embrace the Rock Island and Northwestern territory, though in respect to the latter he is a bold milkman who would attempt further dilution there.

North Missouri Railroad Report.

The following abstract of the report we take from the St. Louis *Republican*:

The earnings and expenses are thus stated:

Transportation of freight	$1,113,209 00
" " passengers	806,572 56
" " express	51,572 56
" " mails	51,908 33
Miscellaneous sources	61,437 09
Total earnings	$2,084,486 23
Expenses	1,653,362 07
Net earnings	$431,124 15

The gross earnings of the previous were $1,037,471.99, which shows an increase for the succeeding year of $1,047,014.06. The number of pounds of freight moved for the last year was 607,929,392. The increase in freight earnings was $589,950.28.

The company have at present sixty-three engines, with eighteen new ones under contract. The length of the road is thus stated: St. Louis to Kansas City, 271 miles. Moberly to Iowa line, 89; and Centralia to Columbia 22 miles—total 382. The company also operates 23 miles of the St. Louis & Cedar Rapids Railroad. Track is being laid on a branch from Brunswick to Chillicothe, 36 miles, which is part of the line to Omaha. The capital stock of the company is $7,871,500. First mortgage, $6,000,000; Second mortgage, $4,000,000; Third mortgage, $5,000,000. An agreement has been made with the purchasers of the second mortgage bonds to postpone, for five years, the payment of the interest which matures prior to April, 1871. Of the third mortgage bonds only $3,000,000 have yet been issued; and the interest for the first five years, from October, 1869, is ten per cent., payable in the stock of the company, and for fourteen years longer at seven per cent., currency.

Railway Compensation.

Railway companies, from their first formation and for all the remainder of their existence, are subject to heavy burdens in Parliamentary fees, and in pains and penalties, as "compensation" first to owners and occupiers of the strips of property required for the construction of lines, for severance of lands, and "general-inconvenience," and, afterwards, when they have been opened, for injuries sustained by passengers. It is to the first of these classes of compensation we mean to refer herein.

At the commencement of the railway era landowners waged an unconditional, uncompromising war against railways, and the predictions indulged in concerning the disastrous results certain to accrue from their formation and the introduction of the locomotive were terrible and startling. They were to prevent cows from grazing and hens from laying; horses were first to be driven mad, and then there was to be no further use for them; the birds of the air were to be poisoned, and the preservation of pheasants and foxes was to be no longer possible. Houses were to be burned down by the fire thrown out of the engine chimneys. Country inns were to be ruined, oats and hay no longer saleable commodities, and general disaster was to result from the introduction of the locomotive. It is unnecessary to say that these gloomy vaticinations have all been falsified, and landowners found that other results of a very different character, and very decidedly to their advantage, followed the formation of railways through their properties. First of all they found that they could command enormous prices for the portions of their lands required, and for "severance," &c., and further, they found the value of their property greatly enhanced by the proximity of railways, or the actual intersection their estates by lines. Having "tasted blood" they changed their tactics, and nowadays landed proprietors, of lords and commoners, are promoters of railways and enemies of abandonments of authorized lines, rather than the obstructives they were in former times. In not a few instances fabulous prices have been paid to landowners for strips of sometimes worthless land and for property required for the construction of lines. These prices have in some instances been paid as a sort of hush money to buy up opposition. If the springs could be laid bare of many of the cases of vehement opposition to abandonments, such, for instance, as the case of the Metropolitan and the Metropolitan District Bills of the present session, some curious revelations would be made. The grievance of owners and occupiers of the uncompleted and proposed-to-be-abandoned portion of the inner circuit is, not, probably, that their properties or occupancy are to be, but rather that they are not to be, disturbed. Owners and occupiers, or injured passengers, never, as a rule, get too little because they do not ask enough. From the beginning, companies have had to deal with the most rapacious and exorbitant demands, and have all sorts of hard names applied to them if they resist, or even criticise such claims. The owners and occupiers of our day follow out the lesson taught them, and, like Shylock, "better the instruction." A remarkable illustration of the extraordinary value of property when it is required for a railway is presented in the case of the Southeastern Company's authorised line from Greenwich to Woolwich. The line was authorized in 1866, when the state of employment and business in the district was very different from what it is now. Had the powers to make the line not been granted then, we feel sure that the company would not have asked for or accepted them now, and that they would be glad to be relieved from the obligation to make the line, and the more perhaps from the demands of compensation which are made upon them. For one section of the line, from Charlton to East Greenwich, of as near as may be a mile in length, twelve acres and a quarter of land is required, for which there are claims amounting to above £42,000, of which land-owners claim above £25,000, or above £2,000 an acre for land in a locality that cannot at present, by any stretch, be called a favorite residential district, although the railway may make it so to the material elongation and aggregate increase of the landowners' rent rolls in the future. The claims include a goodly number for "valuable building land," not yet built upon, and amongst others is a claim of £702 for a public house it is "proposed to build," and for which the obtainment of a spirit license would be "a certainty." Claims for, not hundreds, but thousands of pounds, are made by occupiers whose leases are determinable at one month's notice, and at Michaelmas next absolutely. A yearly tenant paying £40 rent claims £310. The owner of a house for which £55 per annum is paid claims £1,500; the lessee of the same house, whose lease expires next month, claims £30, and the actual tenant of the same house £55 more. For four acres and a quarter of market garden ground to be taken and five and a quarter acres "severed" there is a claim of £11,700. For building land, and the net annual rent of twenty-four houses, to have been built on it, there is a claim of £1,309 10s. For another row of houses, also *in posse*, £922 8s. is claimed. One tenant who rents his land at £5 17s. 6d. per acre, and whose lease expires at Michaelmas next, claims for less than an acre and a quarter to be taken from him, the sum of £2,321 10s., including £50 for "general damage and inconvenience." A lime burner, who sits at a rent of £118 18s, per annum, and is subject to a month's notice from the lessor to quit, claims £2,800.

We cannot say that we wish these claimants may get what they ask for, but rather desire that their claims may be decided by discreet men, liberally by all means, but not in violation of the dictates of justice and equity.

Locomotive Explosions.

The following is a selection from a letter by E. J. Rauch, of Reading, to the *Locomotive Engineers' Journal:*

The frequency of locomotive boiler explosions of late may well be a source of inquiry amongst railroad companies as well as of alarm to engineers. Without intending to offer any theory for these explosions or attempting to account for them in any way, I shall only say, that one "cause of them is that there is a pressure inside of the boiler greater than it will bear."

That boilers are weakened by over-pressure no one will dispute; and that a majority of engineers carry more steam on their boilers than is necessary to do the work required, is a fact that none can deny. And it is to this point I wish to call the attention of your readers, and to endeavor to show why it is done, and how to avoid it.

As a generality all railroad companies allow in their rules only 100 to 110 lbs. of steam pressure, and yet on nearly every engine this is exceeded 10, 20, 30, and even by 50 lbs. On one road in this State I sat on an engine until she was "blowed" up to 175 lbs. to enable her to start her train. When I remarked to the engineer that he carried a high pressure, he replied that he would not give a d——n for less than 150 lbs. to stand still with. On this same road the trains used to be 20 cars, 110 lbs. pressure; now the same engines are hauling 30 to 34 cars, and all done by carrying steam and using sand. This condition has been brought about by the engineers themselves; each one endeavoring to pull a car more than his fellows. The question may be asked why is this allowed? The answer is a plain one. Superintendents scarce care to know anything as to how the trains are handled. Master Mechanics nearly all have engines on their respective roads built, or rebuilt, by themselves, and as a matter of course are ambtious to have a good report of their performances, and if they hear of their engines doing as much work as a bigger one, or more than one of the same size, of another build, they are not apt to inquire how much steam was carried to bring about the result; and should they find out that an undue pressure was carried, it is not at all likely that anything would be said in the way of censure. The only way to correct this evil is to carry no more steam pressure than the rules of the road call for, and do as much work with your engines as you can under the circumstances. Show to your employers that you are willing to study their interest in all things, and when you tell them that your engines are overloaded, there is no doubt that a fair opportunity will be afforded to you to show whether or not your report is a correct one, and if found to be correct, my word for it your loads will be reduced.

In carrying pressure let it be kept as near uniform as possible. The great damage received by boilers is from the variation of pressure. A boiler will last longer under a steady pressure of 110 pounds per square inch than it would if used with a constantly varying pressure of from 70 to 100 pounds. The reason for this is plain; take a sheet of iron and bend it and it will remain so for years without injury, but let it be subjected to a bending and straightening motion, and in a short time the grain or fibre will become chrystalized and rotten. This holds good with boilers; the expansion and contraction due to a varying pressure will do more to weaken them than a very much greater pressure will if kept regular.

—Bills passed first reading in the Tennessee Senate on the 31st ult., declaring null and void one hundred State bonds issued October 2, 1869, to the Mineral Home Railroad Company, and prohibiting the Comptroller and Treasurer from paying eight hundred and eighty-five bonds issued to the Tennessee & Pacific Railroad.

MECHANICS AND ENGINEERING.

The St. Louis Bridge.

The filling of the eastern pier with concrete was finished on the 27th ult., and the laying of masonry above the caisson is commenced. The caisson for the eastern abutment will be placed very soon.

The Hoosac Tunnel.

A measurement of the Hoosac Tunnel excavations has been made lately, showing on the eastern end 31 feet advance last week, and that the whole length is 7,043. The central shaft, which is in process of sinking, is now 336 feet deep, leaving 94 feet to be accomplished to reach the grade of the tunnel. From the west end the tunnel was advanced 45 feet in one week, making it 4,902 feet long. The brick arch which fell some time ago, owing to a slide, has been rebuilt.

The Rock Island Bridge, over the Mississippi.

The government officers in charge of this work are advertising for bids for the construction of the superstructure, as was lately noted in these columns. The following specifications for the work will be of interest:

"The superstructure will consist of one span of two "hundred and sixty feet; one span of two hundred and "sixty-one feet; three spans of two hundred twenty "feet each, and one draw span with two equal openings "of one hundred and sixty feet, and a total length of "three hundred and sixty-six feet."

"Each span will consist of two trusses, thirty-three "feet between centers of top and bottom chords, with "wagon road on bottom chords, and single track rail-"road overhead, allowing twelve feet headway for the "wagon road, and seventeen feet for the railroad. The "trusses to be placed eighteen feet apart in the clear, "with two sidewalks each five feet wide outside, on level "with wagon road floor. Moving load five thousand "pounds per lineal foot. All these spans to be built "entirely of wrought iron. Both the fixed and draw "spans as above will have the material so proportioned "in them that the weight of the structure, including rail-"road track, stringers, etc., together with the moving "load as aforesaid, will in no part cause a tensile "strain of over ten thousand pounds per square inch of "section, nor a shearing strain on the pins of over seven "thousand five hundred pounds per square inch of "section.

"The iron used will be of the toughest and best qual-"ity, and will be thoroughly tested before being put in "the bridge.

"The railing of the sidewalks will be three feet and a "half high. All the iron work will be painted, and "every portion of it must be satisfactory to the engineer "in charge. When completed, the bridge will be sub-"jected to a thorough test, and if the deflection under "the moving load proves greater than the specifications "permit, the whole or any part may be rejected.

"The turn-table and machinery for moving the draw "shall be so constructed, that when the signal is given to "open, it can be thrown to its place over the protection "pier in two minutes, and closed again ready for the "passage of trains and wagons in the same time. It "will be built so that it can be operated either by hand "or steam power."

The Buffalo Bridge.

At the recent meeting of the stockholders of two companies organized to build a railroad bridge over the Niagara between Buffalo and Fort Erie, a consolidation was effected under the name of the "Buffalo Railway Bridge Company." C. J. Brydges, of Montreal, General Manager of the Grand Trunk Railway, was elected President, and Hon. E. G. Spaulding, of Buffalo, Vice-President. The location was decided upon, and a contract for laying the foundations let to Messrs. Gzowski & Co., of Toronto.

How to Unload Gravel Cars.

A labor-saving contrivance for this purpose, now in use on the Southern Minnesota Railroad, is thus described:

"The invention consists of a mammoth double mould-"board plow placed upon the rear car of the train, "which when loaded by the usual gang of men, is con-"ducted to its destination, where by simply uncoup-"ling the engine from the train and coupling to the "plow, which is done by means of a long cable that "traverses the length of the train. The engineer "whistles 'on brakes,' the engine and plow move forward, "the train remains stationary, and the gravel is quickly "and neatly discharged on the track. So one engine and "set of men keep two trains of cars moving, or in other "words, do double the work formerly done with the same "expense. On the occasion spoken of, the conductor "took a loaded train from the gravel pit out upon the "road, something over half a mile, unloaded it and re-"turned to the pit in eleven minutes and a half, where "he found the other train loaded and in readiness to "move out.

"The Ship of the Future."

At a meeting in New York, last week, of the Polytechnic Branch of the American Institute, a Mr. Wyatt read a paper upon the subject of "The Ship of the Future," in the course of which he stated that it would be but a few years before the United States would regain the commercial supremacy lost during the rebellion. England is building nothing but iron ships, while we still cling, and wisely, he thinks, to wooden ones. Aside from the great difficulty experienced in keeping the bottoms of iron ships clean, the sudden changes of temperature have such a great effect upon them as to render them actually unsafe. He was, he said, clearly of the opinion that to this great defect in iron ships might be attributed the loss of the City of Boston; for, coming, as she undoubtedly did, into the immediate vicinity of icebergs, when her whole hull was heated through by her furnaces, caused so sudden and great a contraction as to break her into pieces. This theory, he said, had been clearly demonstrated in our monitors during the war.

Petroleum as Locomotive Fuel.

Two engines on the Strasbourg line have been fitted with M. Deville's furnaces, and are employed in the goods traffic. The consumption of oil in the engines drawing heavy trains is stated to have been from three and a half to five kilogrammes for every kilometer traversed, or (say) from 8 lbs. to 12 lbs. for every two-thirds of a mile. The oil is said to be very completely burnt, and there is no smoke and consequently no waste. Another advantage claimed is, there being no sulphur in the oils, the atmosphere of the tunnels would be free from that most disagreeable and obnoxious contamination, sulphurous acid.

A Pennsylvania Narrow Gauge Railroad.

A correspondent of *Van Nostrand's Engineering Magazine* gives the following account of a narrow gauge railroad connected with the Thomas Iron Works at Hakendaugua, Pa., which was built to carry cinders from the blast furnaces:

"The road is 2 feet 6 inches gauge, and is the same as when we used horse-power. The engines were built by Messrs. M. Baird & Co., at the Baldwin Locomotive Works, in Philadelphia. The steam cylinders are 9 inches diameter and 12 inches stroke; driving wheels 30 inches diameter with steel tires 2 inches thick. In order to economize room, we ascend very rapidly to the tip or dump, and a portion of the road has a gradient of 4 feet in 100 feet, or 211 feet per mile. Our cinder cars are four-wheeled, weighing when loaded 3 tons 5 cwt. gross; wheels only 16 inches diameter. The engines weigh, when ready for work with tank full of water, 8 tons 4 cwt. gross. One of them will haul with ease up this gradient of 211 feet per mile, 8 tons of the cinder cars, making an aggregate of 26 tons, and that with a boiler pressure of only 120 to 125 lbs. per square inch.

New Refrigerating Car.

There has just been put on the New Jersey Railroad a new refrigerating car, designed on a new plan, for the transportation of meat. The car is thirty by eight feet, and has a capacity for the meat of thirty head of cattle. It has double sides and ends, and between the outer and inner walls the space of three inches is filled with cork. The inside of the car is lined with zinc throughout. Near the roof at each end are gratings, upon which is placed the ice, from three to four tons being required for the passage. The cold air is pressed downward, and encircles the meat which is hung in the car, and taking the impurities it is continually throwing off carries them to the upper part of the car at the center, and thence back to the ice, where the drippings are forced off through a pipe running to and through the bottom of the car, and there runs off. In the center of the car, in the top, is a fan or windmill, which, when the car is in motion, is constantly revolving, and forces in air, which adds to the pressure to distribute the air coming from the ice. The meat is kept perfectly dry, and is said to be in a better state than when first dressed.

Old Rails for Sale.

The Great Western Railway Company offers for sale about 5,000 tons of rails which it has recently taken up from its tracks and replaced with new iron. They are of flange pattern, fish-jointed, four inches high, four inches broad at base, and weigh 65 pounds to the yard. They will be delivered at the dock at Windsor (opposite Detroit) within one month, commencing on the 15th of August next. Sealed proposals will be received at the office of the Treasurer, Joseph Price, at Hamilton until the 15th of July.

The Longbridge Steam Brake.

This brake, which elicited so much interest in Chicago last year, was tried recently with success on the Stonington Railroad. It is now in use on the Morris & Essex, the Erie, the Flushing, the South Side, and other railroads.

Steel Fire Boxes.

Homogeneous steel is now very largely used for fire-boxes of locomotives in America. The Baldwin Locomotive Works have adopted this material exclusively, and Hinkley & Williams, the Rhode Island Works, William Mason's Works, and the shops of many railroad companies are using it. A large part of all consumed in America is manufactured by Hussey, Wells & Co., at Pittsburgh.

Improvement in Permanent Way.

Mr. Griffin has lately presented a new system of permanent way in England, which, aside from the important consideration of first cost, seems to be all that could be desired. It is beyond doubt that on lines laid upon this plan enormous amounts would be saved both in tear and wear of road and rolling stock.

The rails appear upon the surface very much like those upon our American street railways. A vertical web, about one inch in thickness, projects downward about five inches below the center of the bottom of the rail. The supporting blocks or sleepers, about 3 feet long, and of 6 inch by 5 inch scantling, lie longitudinally, at proper intervals, on each side of the web and under the rail. The inner supporting block, being lower than the outer, admits of a form of rail that affords working room for the flange of the wheel as the rail wears down at the top. The sleepers are bound firmly together and the rail held in place by horizontal bolts passing through both sleepers and the web of the rail. The rail joints are held by wrought iron clips and double bolts. The gauge of the line is kept by means of T-iron tie rods, cut and bent to suit, and attached at proper intervals. The advantages seem to be in permanence and smoothness. No spikes are used, there is no break of the upper snrface of the timber employed and the rail takes its bearing immediately on the timber, and exhausts the bearing surface of which the timbers used are capable.

The sleeper pieces may be of oak, or other hard wood of enduring nature, which in lengths of about 3 feet of scantling, 6 inches by 5 inches, will cost less than longitudinal sleepers or even transverse sleepers.

Finally, although not exhaustively, the section of rail employed effects a saving of a fourth in weight of iron, and gives nearly, if not quite, double the wearing surface of the ordinary sections.

The London *Engineer* is of the opinion that "Mr. "Griffin has made a valuable contribution towards the "solution of the important problem as to what is the "least costly, the firmest, safest, and most durable per-"manent way."

—The Liverpool Tramways Company have obtained an injunction against the Liverpool Road and Railway Omnibus Company (Limited) restraining them from running on the tramways constructed for the plaintiffs in the town of Liverpool, any carriages or omnibuses licensed to carry passengers for eighteen months from the 1st of November last, the day on which the plaintiffs' tramways were opened. The Vice-Chancellor said the obvious intention of the act was that private individuals should not interfere with the rights of the company by using carriages with wheels adapted to run on the tramway. The defendants, who were very large omnibus proprietors in Liverpool, had been in the habit of running omnibuses of ordinary construction, with wheels on each side of the vehicle, the guage of the axle being 6ft., but in contemplation of the opening of the plaintiffs' line they brought into use some old omnibuses, which had a gauge of 4ft. 8½in., and proceeded to construct others of a similar gauge, with wheels all of equal diameter and placed underneath the carriage. The act gave the public the right to run carriages on the line, but the right was limited to vehicles with ordinary wheels, and the omnibuses of the defendants certainly did not come within that description. The only difference, in fact, between the omnibuses of the plaintiffs and those of the defendants was that while the latter could run on and off the tramway, the former were constructed to run on the line only. The plaintiffs had shown a clear infringement of their rights, and they were entitled to the injunction for which they asked.

—The Sacramento *Union* of the 18th ult. says: "Davis, of Chicago, who came here prepared to enter largely into shipping fruit East this season, but finding that there was no probability of rates being reduced below $950 a car-load, has decided to abandon the attempt and go into other business. It is stated that the railroad companies, having fixed upon rates for the ensuing year, do not find it convenient to change their schedule to accommodate a single interest. Much disappointment is felt among fruit raisers and dealers here."

—The telegraph line along the Lake Superior & Mississippi Railroad, between St. Paul and Dubuque, was on the 21st ult. transferred from the Pacific & Atlantic Telegraph Company to the Northwestern Telegraph Company.

CONTRIBUTORY NEGLIGENCE ON THE PART OF TRAVELERS.

Can a Passenger Recover for Injuries Received to a Member Thrust out of a Car Window?

The Law Times, an English legal journal discusses as follows an American railroad case:

One of the American courts has been discussing a rather peculiar question, which, however, may very easily find its parallel in this country. This question was whether railway travelers are entitled to assume that the track along which a train passes is so clear from obstructions, not only on the line but about it, that if an arm or a head is thrust out of the window whilst the train is in motion it could not be regarded as contributory negligence in the event of an accident happening? The facts of the American case were these. A freight train stood so near to the track of a passenger train that a traveler in the latter who had his elbow out of the window sustained a fracture of the limb by contact with the last carriage of the freight train. These being the facts, the court said: "The question then arises whether the arm outside of the car in that manner was negligence, and if so, was there greater negligence in the company in permitting its freight cars to stand so near the track as to have produced the injury in the manner we supposed it occurred. And if both parties were guilty of negligence, was that of appellee relatively slight when compared with that of appellant?"

As far as we are aware there has been no exactly similar case in this country, but there are one or two decisions which go to establish the doctrine that the question of negligence on the one side and on the other is one of degree merely. The broad English principle respecting contributory negligence is, that a passenger is bound to use all ordinary care to avoid the consequences of the company's negligence. This was the principle stated by Ellenborough in the case of Butterfield vs. Forester (11 East, 60). His Lordship said there:—"A party is not to cast himself upon an obstruction which has been made by the fault of another and avail himself of it, if he do not himself use common and ordinary caution to be in the right. * * * * * * One person being in fault will not dispense with another's using ordinary care for himself. Two things must concur to support this action, an obstruction in the road by the fault of the defendant, and no want of ordinary care to avoid it on the part of the plaintiff." Another case of an analogous kind is that of Clayard vs. Dethick (12 Q. B. 439), which laid down that "in an action for damage occasioned by the defendant's negligence, a material question is, whether or not the plaintiff might have escaped the damage by ordinary care on his own part. But the defendant is not excused merely because the plaintiff knew that some danger existed through the defendant's neglect, and voluntarily incurred such danger." A cabman had attempted to lead his horse over a ditch made by commissioners of sewers in front of a mews. The horse fell and was killed. It was remarked by the judges that in all these cases the question is one of degree.

In Davis *vs.* Mann (10 M. & W. 546) an ass was left on the highway fettered, so as to prevent its going too far away. The defendant, driving his wagon along the highway at a smart pace, ran over the donkey. There the Judge told the jury that the mere fact of negligence on the part of the plaintiff, in leaving his donkey on the public highway, was no answer to the action, unless the donkey's being there was being the immediate cause of the injury; and that, if they were of opinion that it was caused by the fault of the defendant in driving too fast, the mere fact of putting the ass upon the road would not bar the plaintiff of his action. "And that," said Baron Parke, "is perfectly correct; for although the ass may have been wrongfully there, still the defendant was bound to go along the road at such a pace as would be likely to prevent mischief."

In America several cases closely analogous to that under notice have occurred, and, indeed, the same point has been discussed. In the case of Spencer *vs.* The Milwaukee & Prairie du Chien Railway Company (17 Wisconsin 587) the Court said: "When we consider the manner in which railway cars are usually constructed, with the windows so that they can be opened, and arranged at a sufficient height from the seat so that passengers will almost unconsciously place their arms upon the sill for support, there being no bars or slats before the window to prevent their doing so, then to say if a passenger's arm extends the slightest degree beyond the outside surface, he is wanting in proper care and attention, and if any injury happens he cannot recover, because his conduct must have necessarily contributed to the result, appears to us to be laying down a very arbitrary and unreasonable rule of law. It is probably the habit of every person while riding in the cars to rest the arm upon the base of the window. If the window is open it is liable to extend slightly outside. This, we suppose, is a common habit. There is always more or less space between the outside of the car and any structure erected by the side of the track, and must necessarily be so to accommodate the motion of the car. Passengers know this and regulate their conduct accordingly; they do not suppose that the agents and managers of the road suffer obstacles to be so placed as to barely miss the car while passing. And it seems to us almost absurd to hold that in every case and under all circumstances, if the party injured had his arm the smallest fraction of an inch beyond the outside surface he was wanting in ordinary care and prudence."

In the case of Laing vs. Calder *et al.* (8 Penn. State R. 479), it was held that a person traveling on a railway car who permitted his hand to extend outside of the window and thereby had his arm broken in passing a bridge could not recover, if the agent of the company had given timely notice of the danger which the plaintiff might have avoided.

Another case, which, however, has since been overruled, is that of the New Jersey Railroad Company vs. Kimard (9 Harris, 208), where the same court say that "A carrier of either goods or passengers is bound to provide a carriage or vehicle, perfect in all its parts, in default of which he becomes liable for any loss or injury that may be suffered, provided it happens without negligence or misconduct on the part of the party injured. A carrier of passengers is bound to omit no precaution that may conduce to their safety. He is bound to guard against every apparent danger that may beset them. The dangers incident to traveling in railway cars are few in comparison with those incident to other modes of travel, but the most prominent of them is risk of injury to limbs stuck out of windows when the cars are not so constructed as to prevent it. Any one who has traveled by railway must have observed that even the most careful passengers forget the risk and unconsciously suffer their elbows to slip out beyond the window sill. What can a carrier do to prevent it? No more is required than a few metallic rods set in the windows perpendicularly or horizontally, or a netting of wire work, or even wooden slats. None of these would materially impede the circulation of the air or abridge the comfort of the passengers, while it would make their safety sure. A car without any of these appliances is, to coin a phrase, not roadworthy, and a carrier is responsible for any loss that may happen from that cause alone. Risking his passengers in an unsafe car, it behooves him to use every means in his power to guard against danger from it at dangerous places by audibly proclaiming in the car the necessity of keeping arms and heads inside. Should any one disregard such warning he would incur the charge of wilful neglect of his own safety, and where there is negligence on both sides, neither party is answerable for any injury to it."

The court in the principal case expresses a preference for the ruling reviewed rather than the decision on appeal. We differ in this respect. The Court of Appeal held that it was negligence on the part of the passenger to have his arm out of the window, and we conceive that the cautious prudence of Englishmen is the reason of no action of this nature being recorded on our books. A short time since a horrible accident happened to a traveler who put his head out of the window when a train was passing under a railway bridge, and he died from the collision which took place. It probably never occurred to his relations to institute proceedings against the company for negligence in not allowing sufficient room for recreations of this order by passengers. This is really the question upon which the American court express what, with deference, we cannot help considering a remarkable opinion. They say:—"But even if it were to be conceded that it was negligence on the part of appellee to have his arm outside of the car window, should he be precluded from a recovery? Was it negligence on the part of the railway company to permit cars or other heavy permanent bodies to stand so near their tracks that cars in motion must pass within a few inches of such bodies? We suppose it to be a clear and undoubted duty of a railway company to keep its track clear of such obstructions, and a failure to do so is gross negligence. With such objects so nearly in contact with cars running at a high rate of speed, life must necessarily be greatly endangered, and when such negligence as appellee may have been guilty of is compared with the negligence of permitting a freight train to stand so near the track of a passenger train as to have produced the injury which did occur, the former is slight and the latter is gross."

This is a judgment dictated by individual opinion rather than by strict legal principle. We cannot perceive that there could be gross negligence in such a case unless there were actual danger of collision between the trains. Railway companies have a right to assume that passengers will use ordinary care and prudence, and we do not believe that any English jury would find negligence in a company which did not provide room for the protrusion of the limbs of passengers, and if they did we doubt much whether any court would uphold the verdict.

REDUCED CANAL TOLLS AND PROSPECTIVE RAILWAY EARNINGS.

The reduction recently made in tolls levied upon merchandise transported through the canals of this State is conceded, on all sides, to be a very important measure, indicating the development of an enlightened policy too little practiced of late by our public authorities.

But there are valuable private interests which must be more or less affected by the movement, and among these are railroads, especially those great trunk roads which compete for freight with the canals, or have close relations with competing roads. It so happens, also, that beside the advantages which the reduced tolls give the canals, there are other circumstances favoring them, this season, of scarcely less consequence. The cost of operating boats, for instance, has been latterly much reduced: the wages of hands, the cost and feed of horses (especially the former), and the expense of repairs, are all on a much smaller scale than for some years past. Beside this, stimulants to the more rapid transportation which railways afford, are wanting this season. Prices of leading staples are not so high that apprehension of an immediate and disastrous decline need be anticipated, and, consequently, there can be no inclination to hurry forward merchandise by rail, in anticipation of lower prices; then, again, money is easy, and rates of discount everywhere low. Monetary necessities of Western operators often prompt large shipments of merchandise to this market by rail; but, with the money market easy, a low rate of freight becomes a consideration of considerable moment.

We thus see that we have four important circumstances operating in favor of the canals the present season. 1. The reduction of canal tolls; 2. the reduced cost of working canal boats; 3. the absence of any speculative feature in the market, to cause supplies of merchandise to be hurried forward; and 4. the want of any money pressure to promote shipments by rail. These are influences which will be universally admitted to exist. There are some other circumstances which probably affect unfavorably canals and railroads alike. For instance, there is no longer any dispute that the corn crop in the Northwest last year was quite deficient, and the quantity to be delivered at the lake ports is much below that which came forward last season, and the movement of corn is a large item in the transportation business during May, June and July. It is also more than probable that the last crop of spring wheat, which is mostly grown in the Northwestern States, was not a full average, although receipts just now are fully up to last year. The large quantities of wheat in store at Chicago and Milwaukee at the opening of navigation barely afforded employment to lake vessels at low rates, because there was little of the coarser grains to come forward. It would appear, therefore, that while the canals may carry an increased tonnage this season, the prospects of the railroads leading to the West, and for the roads competing with the upper lakes, and for the great trunk roads in New York, are not favorable to so large a tonnage of transportation eastward as last year, while a decline in rates of freight over all the roads east of Chicago appears to be inevitable. We may add that the Kentucky tobacco crop of last year is 30,000 hogsheads short, and and the Ohio Valley appears to have very little else to spare to send eastward for some months. The yield of petroleum, also, though still large, is much less an article of speculation than formerly, and its transportation to market by means of the lateral canals is likely to increase.

We find little, therefore, in any quarter, to promise an increased freight business to any of the leading railroads. What the westward traffic promises may be easily estimated from the reduced imports at this post, and the dullness of trade. The favorable statement of the gross earnings for April was, probably due to the fact that early in April, there was a sudden revival of business, forced upon the country by its absolute necessities, after nearly six months stagnation; gold advanced; there was some revival of speculation; dealers made haste to lay in stocks of merchandise somewhat in advance of their wants; an export demand for breadstuffs sprang up, quite unexpectedly, in this market, and necessitated additions to our supplies by rail, while, in this particular, April last year was duller than the average. With regard to other railroad business, however, it is proper to state that the passenger traffic promises to increase. The flow of travel to Europe, which has been so considerable during late summers, seems to be on the decrease, pleasure-seekers having, with the opening of the Pacific Railroad, discovered that our own country has wonders to be visited. The emigration from Europe to the great West also promises to exceed all previous experience. In this branch of transportation, railways have little competition, and an increased passenger traffic will go far towards making up any deficiency which may occur in the earnings from the transportation of freight. Another important fact is the consideration that the net earnings will be larger, in proportion, on account of the great reduction which is now practicable in the cost of operating railways; still this is much a matter of management, in which the progress made upon different roads may be widely at variance, and no satisfactory estimate therof can be made. It may be fairly presumed, however, that this matter will not be neglected. Looking the whole ground over, therefore, the reader will be able to judge for himself whether there is anything apparent in the immediate future that can seriously affect the value of railway property. As to the canals, the present enlightened policy cannot be measured or tried by the increase or decrease of tolls collected, since the lower rates are a direct benefit, not only to every Eastern consumer, but to every Western producer.—*Commercial and Financial Chronicle.*

Watering Stock.

The *American Railway Times*, in commenting on a rumor of a general consolidation of Western railroads under Vanderbilt's management, (which, by the way, is worth neither more nor less than any other Wall street rumor), says:

"Under the operations of this consolidation and watering process, the entire business interests of the country will suffer to an untold amount from the embargo that the high rates for freight and travel will place upon business enterprise. Practically, every person will have to pay two dollars for what one dollar would have been an ample sum, if the financial concerns of the different railway lines had been managed with a moderate degree of honesty, and we may add, a moderate degree of common sense. The burdens which this system is placing upon the business of the country, will in time become so unbearable that the public indignation will revolutionize the whole railway system, and no man can be elected to Congress or to the State Legislature, unless he is squarely on the platform of "free national highways." We have no doubt as to the final result; we have no doubt but that every dollar of fictitious capital on the railway system will eventually be wiped out of existence by legislative enactment. The doctrine of the "sacredness of vested rights," resting upon legislative charters, has not a very strong hold upon the American people, even where no crime or extortion has been practiced under them; but when the railway speculators and extortionists thus victimize the whole public by doubling or *quadrupling the cost of the transportation* of the country, the public indignation, when once aroused, will not be likely to stop at trifles; the railway charters will be repealed, the fictitious capital ignored, and we trust, the grand band of swindlers and extortionists, will be punished by being compelled to disgorge the immense sums taken wrongfully from the public.

The first prominent public man who takes issue with the railway extortionists will carry the country with him overwhelmingly in all State elections, and, if need be, in the national election. The fictitious capital represented in the cost of railways will double the cost of every barrel of flour, every pound of meal, sugar, tea, or other necessary of life.

General Railroad News.

OLD AND NEW ROADS.

Portland & Kennebec.

This railroad which extends from Portland to Skowhegan, Me., a distance of 100 miles, with a branch from Brunswick to Bath nine miles long, has been leased for 99 years to the Maine Central Company, whose road extends from Portland to Bangor, crossing the Kennebec road at Waterville. The latter has the narrow gauge and the Maine Central the 5 feet 6 inches gauge. The Maine Central connects at Bangor with the European & North American, now in operation 58 miles east of Bangor.

Syracuse Northern.

Ground was broken on the 20th ult., and a considerable force is now prosecuting the work.

New York to Newport.

A new route between these places was opened on the 1st inst. by means of the New York & New Haven Railroad, Shore Line and Newport & Wickford roads and thence by steamers.

Ohio & Mississippi.

It is reported that the Baltimore & Ohio Company is trying to obtain control of this road and thereupon the stock advanced.

Detroit & Bay City.

Utica, Macomb county, voted on the 19th ultimo in favor of $30,000 aid to the above road; rather a useless formality, as the Supreme Court has since decided.

Milwaukee & Northern.

The Board of Supervisors of Milwaukee county has refused to grant aid to this proposed railroad.

St. Croix & Superior.

The corporators have accepted the charter. Philip W. Holmes, of New York, Nathan K. Elmore and Joseph Colamer, of Philadelphia, have been appointed commissioners to open books for stock subscriptions. James Smith, Jr., of St. Paul, attorney for Jay Cooke & Co., subscribed for $500,000 of stock. An election for directors and officers is to be held in Milwaukee July 14.

The Southern Pacific in Congress.

The House Committee on Pacific Railroads, on the 26th ult., agreed to report in favor of the thirty-second parallel trans-continental road. The line is substantially the same as the the Memphis & El Paso, though it is not in the control of Fremont. The bill is framed upon the Union Pacific Railroad law, without the sections giving bonds. The land grant is twenty sections to the mile through States, and forty sections to the mile through Territories. The line it proposes forms a junction, at El Paso, with the line proposed in the Southern Pacific bill reported before in the Senate.

Lawrence & Pleasant Hill.

This road, partly in Kansas and partly in Missouri, intended to give Lawrence facilities equal to those of Kansas City and Leavenworth, has received heavy votes of aid and was once under contract, but afterwards appeared likely to disappear entirely. But it is now reported that on the 26th ult. the Missouri Pacific directors agreed to contract the road. It diminishes considerably the distance to Lawrence and to all places beyond on the Kansas Pacific.

Boston, Hartford & Erie.

The House of Representatives of the Massachusetts Legislature has refused by a vote of 133 to 90 to give any further State aid to this road, which has already had enough to complete it, with honest and skillful management, but is now unfinished and just on the point of bankruptcy.

Ironton, Portsmouth & Cincinnati.

The Cincinnati *Chronicle* says: "Mr. C. J. Quetil, the "engineer in charge of the survey of this road, has ar- "rived at Portsmouth. He makes the distance between "his starting point in Cincinnati and Portsmouth about "eighty-two or three miles, and, allowing ten miles for "curves, he is positive that the entire distance will not "exceed ninety miles. The highest grade at one point "(Mt. Washington) will be about seventy feet, and the "average highest not over fifty feet to the mile. The "curves are long and easy, and the ground well adapted "to a great through route."

St. Louis & Fort Scott.

This company was formally organized in St. Louis on the 24th. Amos W. Mankin, of Missouri, was elected President. The route proposed, which is intended to be very nearly direct, will be seventy-five to one hundred miles shorter than any existing lines. The preliminary surveys will be commenced at once. Mr. J. Fawcett, of Pittsburgh, who is supposed to represent a great deal of Eastern capital, has taken an active part in the organization.

Southern Pacific.

This road, extending from Shreveport, La., westward 56 miles to Hallsville, Texas, is to be extended immediately ten miles further west. B. Hyatt has taken the contract for this extension.

Concord & Claremont.

This road, now extending from Concord west to Bradford, N. H., 27 miles, is to be extended immediately to Claremont, on the Connecticut, where it will join the Sullivan Railroad. The grading and masonry were let some weeks ago.

Northern New Hampshire.

The company will rebuild the bridge over the Connecticut at White River Junction this season.

A Mississippi River Railroad.

It is proposed to complete a railroad route from St. Louis northward along the Mississippi river, by uniting the Quincy & St. Louis and the Quincy & Warsaw projects, and building from Warsaw to Burlington, or a connection with the Carthage & Burlington, perhaps taking in the bit of the Rockford, Rock Island & St. Louis between Sagetown and Keithsburg, and thence building to Rock Island. It is proposed to use the charter of the Dixon & Quincy Company, and make use of some old grades of the long dead Warsaw, Rock Island & Galena Company.

St. Joseph & Denver.

The road has been completed to Hamlin, eleven miles west of Hiawatha, and fifty-two from St. Joseph. The contractors have lately commenced work on the sections between Lebatha and Marysville, and it is expected that the road will be completed to Seneca (thirty miles west of Hiawatha) by the 1st of July.

St. Joseph Bridge.

The company which proposes to build a railroad bridge across the Missouri at St. Joseph, ask Buchanan county (in which St. Joseph is situated) to subscribe $250,000 to the stock.

Dunkirk, Warren & Pittsburgh.

This road is to extend from Dunkirk, N. Y., in a direction east of south to Warren, Pa., where it will connect with the Philadelphia & Erie Railroad, and the Allegheny Valley road. Its entire length will be 54 miles, of which 42 will be in Chatauqua county, N. Y. The lines in the different States have been in charge of different companies, but an agreement to consolidate with excapital of $1,300,000 has been made. The road is well under way and will soon be completed. In connection with the Allegheny Valley road it will form a route from Dunkirk to Pittsburgh, 186 miles long.

Northern Pacific.

The following description of the located portion of the line is taken from a private circular to contractors, issued by the company:

"The portion of the Northern Pacific Railroad for the construction of which proposals are solicited, commences near the northeast corner of town 48, range 17, Carleton county, Minnesota, at a point on the line of the Lake Superior & Mississippi railroad near the Dalles, so called, of the St. Louis river. From thence its course is nearly due west to the Mississippi river; thence a little to the south of west, on nearly a direct line to the Otter Tail or Rush Lake; and from this latter point it pursues a northwesterly direction to the Red river, meeting the latter between the Buffalo and Wild Rice Rivers.

"The country from the starting point to within about twenty-five miles of the Red River is more or less timbered, the growth being black, white and yellow pine, poplar and birch, and, in the swamps, tamarac. There is little or no cedar, and but a small amount of spruce. On the western portion of the line is oak and some elm and other hard woods. From the divide between the St. Louis & Mississippi Rivers to a point some distance west of the Mississippi, the country is, much of it, low and swampy, the latter portions are separated by sand ridges of no great elevation. The tamarac in the swamps is in general not dense nor does it attain to a very large size. The ties for this section will be composed mainly of tamarac and Norway pine. Upon the western portion of the line there are, on entering the region of the Leaf Hills, west of Red Eye river, patches of prairie, and for the last thirty miles, next to the Red river, the country is all prairie and very level. The Leaf Hills, as they are called, enclose the Otter Tail and other Lakes in the same series, and form the divide between the Mississippi and Red river waters. They are not continuous, and vary in elevation, are of a drift formation, composed of earth, gravel and boulders. It is not known that any rock in place will be met with in the roadway excavation on the entire line, but the boulders are, many of them, large enough to be broken up and used for masonry in the structures. Tamarac and oak can, it is supposed, be easily obtained for the timber ties on this section. Pine for trestle-work and bridges must be sought for east of the Red Eye river. The soil in this western portion is in general of a superior quality. After leaving the sandy region east it changes to a loam and gravel, and, in approaching the Red river, there is more or less clay."

Saginaw & St. Clair.

East Saginaw voted almost unanimously on the 25th ultimo, in favor of granting aid to this road to the extent of $150,000 in ten per cent. bonds, on condition that the company locates its general offices, shops, etc., in the city.

Fort Dodge & Minnesota.

Mr. N. B. Everett, Chief Engineer of the company, was in Blue Earth City a short time since, to secure the profile and transit notes of the survey made last summer from Mankato *via* Blue Earth City to the State line, and to ascertain the exact point at which that survey strikes the line. The officers of the company are very sanguine that the road will be put under contract and a considerable portion of the work done this season.

Denver Pacific.

The track is finished and trains are running to a point seventy-four miles south of Cheyenne and thirty-two miles north of Denver, where a station called "Johnson" has been established. The track is to reach Denver within a month.

Oshkosh & Mississippi.

Edward Sargent, Engineer of the Oshkosh & Mississippi Railroad Company, has made a report of the survey of the route between Oshkosh and Ripon, showing that the work now done on the route is worth $15,575, and to complete it ready for the iron will cost $53,440. When subscriptions to stock are completed, the work of finishing the road will commence at once.

Leavenworth, Lawrence & Galveston.

The road bed is ready for the iron as far south as Iola, a town on the Neosho, eight miles north of Humboldt.

Chesapeake & Ohio.

The Wheeling *Register* says that the contracts for the completion of this road from Gauley to the Ohio (100 miles) have been awarded, and the time for their fulfilment fixed, under heavy penalties, at May 1, 1871. The contracts for the heavy work on the line from Gauley eastward have also been let. This portion of the road, owing to the tunneling, heavy cuts and embankments along the route, will require two and a half years to finish. About 2,000 laborers are already at work, and their number will soon be increased to 6,000.

Cairo & Fulton.

A letter from Little Rock to the Quincy *Whig* says that a contract has at last been made with responsible parties for the construction of the road. Twenty miles of the section between Little Rock and Jacksonport will be ready for the cars in October next. Gen, Mason Brayman, President since the war closed, declined a re-election on account of failing health. A resolution recently passed by Congress, provides that the company shall not forfeit its land grant if it completes the first twenty miles of the road by the 20th of December next.

Southern Pennsylvania.

The Southern Pennsylvania Iron & Railroad Company is building 25 miles of road in the Cumberland Valley, and offers $625,000 of their 1st mortgage bonds, having 30 years to run, J. Edgar Thompson, and Frederick Watt being the trustees. The company's capital stock is $1,000,000, of which $955,000 has been subscribed by the people living along the route of the road or interested in properties in the vicinity. The Pennsylvania Railroad Company has taken $300,000 of the bonds at par. The road will extend from Bedford, Pa., to Cumberland, Md., on the Potomac, and in connection with the Huntington & Broad Top Railroad at Bedford, will form a branch of the Pennsylvania about 75 miles long.

The American Central in Iowa.

At a meeting in Sigourney, Iowa, lately, Judge Thompson, President of the American Central Railroad, stated that negotiations had been closed up with the Chicago, Burlington & Quincy Railroad Company, whereby the latter had agreed to endorse the bonds of the American Central to the amount of $18,000 per mile, the two companies to unite in building a bridge at New Boston, and the entire line to be operated by the Chicago, Burlington & Quincy Company.

Iowa Central.

The grading between Albia and Oskaloosa is nearly completed, and track-laying begins on the 15th of June. The Marshalltown & Oskaloosa Division will be ready for iron on the 1st day of August.

Muscatine Western.

This company was fairly organized on Monday of last week. The capital stock is fixed at $10,000,000,—to be increased to $20,000,000, if circumstances should warrant it.

Iowa Southern.

The Nebraska City *Chronicle* is informed that this road which was supposed to be absorbed by the Burlington & Southwestern, is to be built immediately from Farmington westward.

Cincinnati, Lafayette & Chicago.

Articles of association have been filed in Indiana for a line of railroad running from Lafayette, through Tippecanoe, Benton, and Newton counties, to intersect the Toledo & Warsaw line near the Illinois line. It is to be forty-five miles long. This road will be in the direction of Kankakee and if completed to that point would give the Baltimore & Ohio Railroad a connection with the Illinois Central at that point.

Cincinnati, Richmond & Fort Wayne.

The last rail on this road was laid at Richmond on the 30th ult.

New Albany & St. Louis Air Line.

The directors have decided to put under contract the ten miles of the road from Princeton, Gibson county, Ind., to the east bank of the Wabash River, at Mt. Carmel, Illinois. Arrangements are being made to have the line completed by the 1st of January.

Grand Rapids & Lake Shore.

It has been decided to extend this proposed road through Muskegon and Ludington to Manistee. It is reported that means have been secured to complete the road by July 1, 1871.

Portland & Ogdensburg.

Ninety miles of the line of this road has been put under contract. Tracklaying has commenced at Cumberland.

Boston & Lowell.

This company has bought the Lexington & Arlington Railroad (Boston to Lexington, 11 miles), and, it is said, intends to complete this road to Chelmsford, and connect at Nashua with the Portland & Rochester Railroad.

Minneapolis Western.

The Company advertises for sealed proposals for the grading of six sections which will carry the road-bed from Minneapolis to the Minnesota river. These bids will be received until June 3, 1870. At that time the contract will be awarded and the work begun, and put forward as rapidly as possible. In accordance with the provisions of the charter of the company, its name has been changed to the Minneapolis & St. Louis Railway Company.

Baraboo Air Line.

A strong effort will be made this season to build this road, either in connection with other railroads or without.

South Georgia & Florida.

This Railroad, extending from the Atlantic & Gulf Railroad at Thomasville, Ga., north to Albany, Ga., is completed, and will be operated in connection with the Atlantic & Gulf Railroad, giving a new outlet to Savannah to Southwest Georgia. The part completed is nearly 60 miles long. It was originally intended to build it also south from Thomasville about 20 miles to Monticello, Fla., in order to make a connection with the Jacksonville & Tallahassee line.

Brunswick & Albany.

This road is completed from Brunswick west to Warrensboro, seven miles beyond the crossing of the Atlantic & Gulf road, and 66½ miles from Brunswick. Regular freight and passenger trains will be put on very soon.

Decatur & East St. Louis.

It is expected that this road will be completed through to East St. Louis by the middle of this month.

Quincy & Warsaw.

The first ground was broken for this road at Bear Creek, Hancock county, on the 23d ult.

Chicago, Pekin & Southwestern.

Messrs. Boyington & Rust, of Chicago, have just completed, for the Chicago, Pekin & Southwestern Railroad, a Howe Truss Bridge across the Vermillion river, consisting of two spans of 128 feet each in length, and 50 feet above the bed of the river. The piers are all in readiness for another bridge, of five spans, of 128 feet in length, across the Illinois river at Marseilles, and this will soon be built. The timber is on the ground now. The line of the road is graded most of the way between Marseilles and Pekin, and there have been several deep cuts and heavy fills made in passing through the bluffs and over the ravines on the south side of the river. It is intended to complete the road within a year.

Marquette & Ontonagon.

The Marquette & Ontonagon Railroad extends from here west to the Champion mine, a distance of 33 miles. During the shipping season the road does a heavy business bringing down ore from the mines. They are now running thirty-eight trains per day. They have an ore dock here of a capacity of 9,000 tons, from which 12 to 14 vessels can be loaded per day. They have beside a stone dock or pier where merchandise is received from the steamboats for shipment over the road; it is also used for the shipment of pig iron. Their car and machine shops, foundry, etc., are located here. At their shops are built all the rolling stock of the road except locomotives. Their two elegant passenger coaches and baggage car were built here. They employ in the various departments about 200 mechanics. The resident officers of the road are: Samuel P. Ely, Vice President and Agent; C. Donkersley, Superintendent; A. C. Thiel, Master of Transportation; J. F. Sohier, General Freight Agent; E. B. Gay, Auditor and Cashier; Fred. M. Steele, Pay Master; Walter Finney, General Passenger Agent.—*Marquette Mining Journal.*

Grand Rapids & Indiana.

The third section of this railroad north of Grand Rapids, extending through Big Rapids and to Paris, Mecosta county, five miles further north, is all graded and ready for the iron. The track will be laid to Big Rapids, 55 miles from Grand Rapids, by the middle of this month and trains running regularly. Soon after the iron will be down as far as Paris. Grading is going on on the section of twenty miles north of Paris. The Flint & Pere Marquette Railroad is to cross near Paris.

St. John & St. Augustine.

Before the war a railroad line was graded between Tocoi, Fla., a landing on the St. John River, about 75 miles south of Jacksonville, and St. Augustine, on the coast, a resort for invalids and interesting as the seat of Spanish dominion in Florida and the oldest city in the United States. Work has been resumed on this line, which is but fifteen or sixteen miles long, and it is intended to complete it in time for next winter's business, which will be almost exclusively the carrying of tourists and invalids, as the county on the line is barren and uninhabited.

Wilmington & Manchester.

The part of the road in North Carolina was sold recently to satisfy the bondholders, and these are notified by M. Crouly, Commissioner and Referee at Wilmington, N. C., a percentage of $30.72 will be paid them from the avails of the sale. The purchasers of the road have since organized under the name of the Wilmington, Columbia & Augusta Railroad Company.

Kalamazoo & South Haven.

The road is completed from Kalamazoo to Bloomingdale. About sixteen miles of road bed remain to be constructed, and the iron for eight miles of this is purchased and on the way. The road, it is thought, will not be delayed by the decision against the validity of the municipal bonds.

St. Louis & Keokuk.

The Keokuk *Gate City* gives the following description of the route and the prospects of this line:

"To Wentzville, under an arrangement now complete, "the St. Louis & Keokuk road will run on the line of "the North Missouri. There the road diverges, following the Mississippi, at an average distance of some fifteen miles. Passing through the county seats of Lincoln, Pike, and Ralls counties, until it strikes the Hannibal & St. Joseph road, and under an arrangement "already complete with that, it will run to West Quincy. "So the building of seventy-five miles will complete the "line from St. Louis to West Quincy. The road all the "way runs through the best part of Missouri. To build "these seventy-five miles of easy line, the counties interested have issued $750,000 in bonds. Some of the "most substantial business men of St. Louis have assured "Col. Smith that not for want of iron nor anything else "must the prosecution of the road be hindered a day. "The whole distance was put in strict and responsible "contract; the parties were put in bonds to commence "work in five days from the signing of the contract; to "have a good part of it done by October 1, of this year, "and the whole route complete and in running order by "Oct. 1, 1871. The money, material and labor is ready, "and the work will be put through.

"From West Quincy to Canton, Judge Davis, of the "latter place, is building the road. He has nearly all of "it graded; has the ties, and is ready for tieing. That "will complete the road to within twenty-two miles of "Keokuk and that link is to be put through as the "others. By one year from October next, the whole "road will be complete and running from Keokuk to St. "Louis, a distance of 170 miles."

California & Oregon.

The track, on the 23d ultimo, was laid to a point 29 miles north of Marysville, California. The work is progressing at the rate of half a mile per day, but they expect to shortly increase to double that rate. The road is expected to be completed to Chico by the 15th instant.

White Pine & Central Pacific.

The citizens of Hamilton, Nevada, met on the 21st ult. to take steps toward building a railroad connecting White Pine and the adjoining districts with some point on the Central Pacific road. A committee was selected to confer with the corporators of the Colorado & Nevada Railroad & Navigation Company, and ascertain if that company could be induced to transfer their right to the county bounties authorized by the Legislature of 1869.

LOCOMOTIVE STATISTICS.

Illinois Central.

The report of S. J. Hayes, Superintendent of Machinery of the Illinois Central Railroad, for the month of February, 1870, affords the following:

The number of miles run by trains was as follows:

Passenger trains	100,099
Freight "	315,877
Construction "	4,904
Switching "	46,087
Total	466,967

The cost per mile run was

For oil and waste	.77 cts.
" fuel	7.78 "
" engineers and firemen	5.86 "
" cleaning	1.11 "
" repairs	11.61 "
Total	27.14 cts.

Cost per mile run, in cents:

Passenger engines	21.86 cts.
Freight "	29.21 "
Construction "	14.54 "
Switching "	15.23 "
Average cost per mile for each car hauled	2.03 "

Average number of miles run to

Pint of oil	13.38
Ton of coal	33.33

The above oil includes that used in headlights and in lamps of engineers. Wood is rated at $6.50 per cord, coal at $2.25 per ton, in Illinois and at $2.50 on Iowa Division; oil, 60c. per gallon; waste, 15c. per pound. Rebuilding, superintending, teaming and all other expenditures appertaining to repairs are included in the above cost of performance of locomotives.

The whole number of locomotives owned by the company is 179, all but two coal burners. The length of the road operated is 939 miles. 9 are undergoing repairs, 3 are rebuilding, and 5 have had general repairs during the month.

Toledo, Peoria & Warsaw.

The following is the report of the general average of performance of locomotives on the Toledo, Peoria & Warsaw Railway for the month of April, 1870, as made by A. H. de Clercq, Master Mechanic:

Cost per mile for engineers, firemen and wipers	7.13 cts.
Cost per mile for repairs of engine	7.83 "
Cost per mile for oil, waste, tallow and rags	1.23 "
" " " fuel	6.47 "
Total cost per mile run	22.69 cts.
Miles run to pint of oil	17.87
" " ton of coal	46.73

The above includes all kinds of oil consumed and superintendence, and all other expenditures appertaining to repair of locomotives.

Average cost of oil $1.05 per gallon. Coal is charged at $2.75 per ton, and wood at $4 per cord. Whole number of engines 45, of which 12 made no mileage; 1 is rebuilding; 1 is undergoing thorough overhauling, and 2 have had slight repairs.

TRAFFIC AND EARNINGS.

—A Portage, Wis., correspondent of the Chicago *Tribune* says that wheat can now be sent from any point on the Fox and Wisconsin rivers to Buffalo, by water, cheaper than it can now be sent to Chicago or Milwaukee by rail, thus saving more than the entire lake freights.

—The following shows the comparative receipts of flour and grain at the ports of Chicago, Milwaukee, Toledo, Detroit, and Cleveland, from January 1 to May 21, in the years indicated:

	1870.	1869.	1868.
Flour, bbls	1,404,260	2,080,375	1,330,441
Wheat, bu	7,965,208	7,829,203	5,429,045
Corn, bu	5,937,491	10,455,817	10,940,137
Oats, bu	2,474,557	3,579,735	3,062,540
Barley, bu	534,338	386,599	373,459
Rye, bu	244,835	461,585	176,544
Total bu	17,157,929	22,707,829	20,001,725

The following shows the movement of flour and grain, including the receipts at Chicago, Milwaukee, Toledo, Detroit and Cleveland, from August 1, 1869, to May 21, 1870, and for about the corresponding periods in the years indicated:

	1869-70.	1868-69.	1867-68.	1866-67.
Flour, bbls	4,096,839	4,542,095	3,661,380	3,313,389
Wheat, bu	35,339,043	31,175,421	28,371,011	20,184,784
Corn, bu	19,295,169	22,855,663	23,549,323	23,164,388
Oats, bu	9,735,663	19,860,999	13,780,076	6,951,755
Barley, bu	2,562,985	2,629,942	2,574,016	2,291,746
Rye, bu	1,636,348	2,086,381	1,289,694	1,681,358
Total grain, bu	67,969,218	78,628,405	69,564,129	54,274,011

—The Northern Railroad of New Hampshire, extends from Concord to West Lebanon (opposite White River Junction). It is 69 miles long with a branch from Franklin (19 miles north of Concord) to Bristol, 13½ miles long. Thus the total length is 82½ miles. It has twenty-four locomotives and 482 cars. The earnings for the year ending March 31, 1870, were $689,628.03; the expenses, $433,356.11; net earnings, $256,271.92. The receipts were $74,011.44 greater and the expenses $7,403 greater than the previous year. The number of passengers increased 10 per cent. and the tonnage of freight 17 per cent.

ELECTIONS AND APPOINTMENTS.

—Wm. H. Fuller has been appointed Assistant Engineer of the Southern Minnesota Railroad.

—The following gentlemen have been elected Directors of the Philadelphia & Southern Mail Steamship Company: S. Flanagan, Henry Winsor, Winfield S. Russell, Richard Wood, Wm. Massey, George N. Allen, James A. Wright.

—W. L. Malcolm, late agent at Buffalo of the Great Western of Canada and leased lines, has been appointed Assistant Superintendent in charge of the Erie & Niagara Railroad, which extends from Fort Erie, opposite Buffalo, down the Niagara river thirty-one miles to Niagara Wharf, where it connects with steamboats on Lake Ontario for Toronto. The road is leased by the Great Western Company.

—At the meeting of the stockholders, upon the re-organization of the St. John & St. Augistine (Fla.) Railroad Company, John P. Sanderson, Esq., Maj. John Westcott, Abraham R. Day, J. S. Swaim and A. B. Conover, were elected directors; Col. Sanderson, President; Major Westcott, Secretary; P. H. Skidmore, Treasurer, and Abraham R. Day, Chief Engineer and Superintendent.

—The following were elected directors of the Chicago & Northwestern Railway Company at the annual meeting of stockholders on the 2d inst:

J. M. Burke, H. H. Baxter, G. S. Scott, A. G. Dulman, M. L. Sykes, Jr., Charles R. Marvin, Harvey Kennedy, A. B. Baylis, New York; J. L. Ten Have, Frzn., Amsterdam, Holland; William L. Scott, Milton Courtright, Erie, Pa.; R. P. Flower, Watertown, N. Y.; H. R. Pierson, John B. Turner, George L. Dunlap, Henry H. Porter, John F. Tracy, Chicago.

—At the Annual election of the Chicago, Rock Island & Pacific Railroad Company on the 1st inst. the following directors were elected:

David Dows, Francis H. Tows, A. G. Dulman, Charles R. Marvin, New York; Robert A. Forsyth, Newburg, N. Y.; Milton Courtright, Wm. L. Scott, John Hearn, Erie, Pa.; John F. Tracy, Henry H. Porter, Chicago; Ebenezer Cook, George L. Davenport, Davenport, Iowa; B. F. Allen, Des Moines, Iowa.

—Mr. F. B. Lord has assumed the duties of General Passenger Agent of the Indianapolis, Cincinnati & Lafayette Railroad. Mr. A. E. Clark transacts the business of the general ticket department.

Mr. Lord has long been identified with the interests of the road, and is a brother of the President, Mr. H, C. Lord.

—Wm. H. Sayre, Jr., for many years General Agent of the Lehigh Valley Railroad, with office at Mauch Chunk, Pa., has been appointed to the position of President's Assistant, and will perform the duties of the office conjointly with that of General Agent.

—Lloyd Chamberlain, formerly Secretary, has been elected Treasurer of the Lehigh Valley Railroad Company, in place of Charles C. Longstreth, deceased.

—John R. Fanshawe has been elected Secretary of the Lehigh Valley Railroad Company, in place of L. Chamberlain, appointed Treasurer of the same company.

—The newly chosen Board of Directors of the Mobile & Ohio Railroad Company have re-elected Abraham Murdock President, and C. E. Rushing, Vice President, for the ensuing year; they have also elected W. D. Dunn and P. Hamilton, members of the Executive Committee, composed of them and the two officers above named.

—Charles E. Gorham, Superintendent of the Western Division of the Pittsburgh, Fort Wayne & Chicago Railway, has been appointed Superintendent of the Indiana Division (Fort Wayne to Sturgis) of the Grand Rapids & Indiana Railroad. This part of the road will be open for business in a month or less. Mr. Gorham has appointed H. D. Wallin Assistant Superintendent; O. R. Simmons, Road Master; and James M. Boon, Master Mechanic. Boon and Simmons hold similar positions on the Fort Wayne road.

—A. D. Lockwood, of Lewiston, has been chosen President of the Maine Central Railroad Company in place of R. B. Dunn, resigned.

—The directors chosen at the last election by the stockholders of the New York & New Haven Railroad Company are Wm. D. Bishop, Nathaniel Wheeler, Bridgeport; George B. Carhart, James J. Roosevelt, Wilson G. Hunt, New York; E. H. Trowbridge, New Haven; Jonathan Godfried, Southport, and Nathaniel A. Baldwin, Milford.

—Committee No. 6 of the New York Chamber of Commerce, which is charged with the consideration of questions relating to railroads, canals, and internal improvements, consists, by recent appointment, of John Taylor Johnston, Chairman; Samuel Sloan, William B. Ogden, Charles Butler, Hiram Walbridge, Alexander M. White, Solon Humphreys, James P. Wallace, Levi P. Morton, Morris K. Jesup, Lucius J. N. Stark, Hugh Allen and Abram S. Hewitt.

PERSONAL.

—In announcing the appointment of Alfred Tyler, for some years General Superintendent of the Philadelphia & Erie Railroad, as Vice President of the South Carolina Railroad Company, the Philadelphia *Railroad Register* says:

"The *morale* of a railroad staff cannot be kept except under a large-minded chief, who selects his staff officers with caution, and then bestows on them his entire confidence, assigning to them their duties and leaving them to execute them without interference. Each is thereby thrown upon his mettle, and soon takes pride in his department, knowing that he will be blamed only for his own mistakes, and that he will have credit for whatever successes become apparent. The prosperity of the Pennsylvania Central is largely due to such a policy consistently pursued by Mr. Thomson. The result has been the gradual instruction and confirmation of a large number of first-class railroad men, heads of departments, capable of meeting any emergency and overcoming any difficulty; imbued themselves with the spirit of this policy, and treating their subordinates with the same respect for their responsibilities, with which they have themselves been treated. Mr. Tyler's administration of the Philadelphia & Erie road is but a repetition of what is so familiar to the officers of the main line.

—J. E. Thompson, the St. Paul banker, who died very suddenly last week, was Treasurer of the St. Paul & Chicago Railroad Company and a director of the St. Paul & Sioux City Company.

MISCELLANEOUS.

—The contractors on the Iowa Central Railroad are bound by a provision in their contract, to allow no liquor to be sold upon the road, nor to employ any hands using it.

—The land sales of the Union Pacific Railroad for the month of April were 8,266 acres, for $55,973.38. The total sold to date, since July, 1869, is 159,032 acres, realizing $717,789.34.

—The Austin, Texas, *State Journal* says a package was the other day received there from Boston, the charges on which were $14.85 from Boston to Brenham, over 1,500 miles, and $15.70 from Brenham, to Austin, a distance of only 90 miles.

—The Chattanooga *Times* says that a company is now in process of organization for establishing a car and car-wheel factory in that city. The capital stock is to be $100,000, in shares of $500 each: "Mr. Richard Brom-"ley, of Ohio, is taking the lead in this enterprise, and "is ably backed by Mr. Lowe, of the Vulcan Works, and "others prominently interested in the material develop-"ment of the country. As soon as $75,000 have been "subscribed a meeting will be called for organization and "to commence the construction of the works. Already "$40,000 have been obtained, and no difficulty is antici-"pated in getting the full amount."

—The Omaha Northwestern and Omaha Southwestern have each ordered a new locomotive—their first.

—The agents of the fast freight lines having entered into an agreement not to "cut" the published rates, have been driven to other expedients to secure the transportation of freight over their lines. About the cutest of these is this: The agent goes to a shipper and says that he cannot in honor cut the rates, but that if he (the shipper) will favor that line, a bill of damages caused to freight in transportation will be allowed. We haven't heard of this succeeding as yet.—*Indianapolis News.*

—The Detroit *Tribune* gives the following account of the railroad bonds delivered at the Michigan State Treasury during the week ending May 25:

Romeo & Almont	$45,000
Michigan Lake Shore	30,000
Toledo, Ypsilanti & Saginaw	10,000
	$85,000

The bonds of the township of Pine Grove, Van Buren county, in aid of the Kalamazoo & South Haven Railroad Company, amounting to $12,400, were delivered to the company May 20.

—The reports of the various auditors of the counties through which the Atlantic & Great Western Railroad passes, have valued the property of that corporation subject to taxation at $4,170,000, an increase of $600,000 during the past year.

—The Grand Rapids & Lake Shore Railroad have registered a mortgage in Ottawa county to J. F. Joy and Governor Baldwin, by which they are enabled to obtain the requisite amount of money for the completion of the road from Grand Rapids to Pentwater.

—The Superintendent of the New Jersey Southern Railroad has issued the following order: "Employes of "this company are prohibited the use of smoking tobac-"co, in any of its forms, while on duty. Its use is a hin-"drance to, and inconsistent with, the duties of all em-"ployes, while to such as come in contact with the trav-"eling public, the order has additional force from the "fact that to so many of the latter tobacco in any form "is offensive."

—The Clevelend *Herald* of the 25th ult. says: "We understand that the Oil Creek extension of the Lake Shore road was completed to Oil City, and connected with the Oil Creek road on Saturday last. In making this connection it became necessary for the track to cross the tracks of the Atlantic & Great Western Railway. Great difficulty was experienced by the Lake Shore people in making this crossing, owing to an Erie Railway train constantly moving over the point of crossing for two or three days; but the Erie men, becoming tired of the contest, withdrew for a time, when the track was put down in proper shape, so that all the roads were in as good condition as before. Monday morning, before daybreak, a large mob were brought down to the 'field of action' on one of the Erie trains, and were at once put to the task of destroying the track and property of the Lake Shore Company."

—The steamers of the Philadelphia & Southern Mail Steamship Company during the year 1869 performed the following service: The Pioneer, on the Wilmington line, made twenty-three round voyages; the Tonawanda and Wyoming, on the Savannah line, made forty-five round voyages; the Juniata and Yazoo, on the New Orleans & Havana line, made eighteen round voyages, stopping at Havana on each return voyage, and on twelve outward trips. The earnings were $610,447.79—only $59,330.39 more than the expenses.

A Verdict for Damages for Personal Injuries.

Mr. Tracey E. Roberts, a well-known merchant of this city, commenced an action some time ago for the purpose of recovering $100,000 from the Toledo & Wabash Railroad Company for personal injuries, which he claimed he had sustained by reason of the wrongful and negligent acts of the agents of the defendants. The facts may be briefly stated as follows: The plaintiff, Roberts, in January, 1865, was traveling over some parts of the defendant's road with a free pass. It appears that prior to the date named, he, as a commercial traveler, and as a member of a firm here in New York, which was in the habit of regularly sending large amounts of goods by a certain express company to the West, obtained through this express company free passes to ride over certain roads—among others the defendant's road. The accident happened near the town of Lafayette, Ind., in consequence of the rear car of the train, in which the plaintiff was, being upset by coming in contact with some obstruction at the switch, or in jumping what is commonly known as the frog of the switch. The plaintiff's hip joint was dislocated, and after being attended by surgeons in Indiana for about eight weeks, he did not seem to get much better, and was finally brought on to New York, where he was attended by such medical men as Drs. Parker and Swinburne. They examined the plaintiff thoroughly; gave him ether and chloroform, and then operated on his hip with pulleys and otherwise, for the purpose of setting the hip joint properly, which they found was dislocated, but as they testified on the stand, they found that too long a time had elapsed since the injury; the muscles and integuments had, to an extent become fixed in their new places, and the surgeons would not consent to endanger the life of their patient by continuing the operation. The result is that the injured limb is much shorter than the other, and always will be.

The testimony in regard to the free pass was somewhat conflicting. The plaintiff's testimony was to the effect that he had a free pass when he started from New York, but that when he got out into the State of Indiana he was compelled, by the necessities of his business, to branch off onto side lines, and that having done so once or twice, he either lost or destroyed the pass he had from the defendadts a short time before the accident, and that he was riding as a paying passenger when he was injured.

On the other hand testimony was given for the defendants to the effect that immediately after the injury at Lafayette, an agent of the company called on the plaintiff, and asked him if he had a pass at the time. That plaintiff replied, "Yes, he had," and immediately felt in his pockets for it, but without finding it. This the plaintiff, under oath, denied. The defendants say that plaintiff not only had a free pass at the time, but that the same was given to him in New York with the express understanding that he or any one else accepting such a pass and traveling upon it, should not hold the company responsible for any injuries or damages to person or property of the holder, whether arising from the negligence of the agents of the defendants, or otherwise.

Judge Brady of the Supreme Court, charging the jury, said that as he understood the law of this State as laid down by the Court of Appeals, the defendants in this case would not be liable for any ordinary acts of negligence on the part of their agents, provided at the time of the accident, the plaintiff was traveling on a free pass, by the terms of which it appeared that the Company had given notice that they would not be responsible for damages: The Judge said it had not yet been decided that, with a free pass, railroad companies could not be made responsible in cases of gross negligence. In this case he did not think any gross negligence had been shown. Carriers of passengers are not insurers in any event.

The jury, after an absence of two hours, rendered a verdict for the plaintiff of $6,000, to which the Court, on motion, added an allowance, by way of costs, of 5 per cent.—*New York Times.*

RAILROAD GAZETTE

PUBLISHED EVERY SATURDAY.

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Editorial Announcements.

Correspondence.—We cordially invite the co-operation of the Railroad Public in affording us the material for a thorough and worthy Railroad paper. Railroad news, annual reports, notices of appointments, resignations, etc., and information concerning improvements will be gratefully received. We make it our business to inform the public concerning the progress of new lines, and are always glad to receive news of them.

Articles.—We desire articles relating to railroads, and, if acceptable, will pay liberally for them. Articles concerning railroad management, engineering, rolling stock and machinery, by men practically acquainted with these subjects, are especially desired.

Inventions.—Those who wish to make their inventions known to railroad men can have them fully described in the RAILROAD GAZETTE, *if not previously published,* FREE OF CHARGE. *They are invited to send us drawings or models and specifications. When engravings are necessary the inventor is expected to furnish his own engravings or to pay for them.*

☞ *Our Prospectus and Business Notices will be found on the last page.*

THE NEW NORTHWESTERN DIRECTORY.

At the election of directors of the Chicago & Northwestern Railway Company, held in this city last Thursday afternoon, the following were chosen:

John M. Burke, New York.	J. L. Ten Have, Frzn., Amsterdam, Holland.
H. H. Baxter, New York.	Wm. L. Scott, Erie, Pa.
George S. Scott, New York.	Milton Courtright, Erie, Pa.
Anthony G. Dulman, New York.	H. R. Pierson, Chicago.
M. L. Sykes, Jr., New York.	John B. Turner, Chicago.
Charles R. Marvin, New York.	George L. Dunlap, Chicago.
Harvey Kennedy, New York.	Henry H. Porter, Chicago.
A. B. Baylis, New York.	John F. Tracy, Chicago.
R. P. Flower, Watertown, N. Y.	

Of these seventeen Directors, nine—Messrs. Burke, Baxter, George S. Scott, Dulman, Sykes, Ten Have, Pierson, Turner and Dunlap—were members of the old Board. Six members—Messrs. Dulman, Marvin, Wm. L. Scott, Courtright, Porter and Tracy—are also members of the Board of Directors of the Chicago, Rock Island & Pacific Railroad Company, elected last Wednesday, and two of these—Messrs. Courtright and William L. Scott—are also members of the Lake Shore & Michigan Southern board. H. H. Baxter is one of the directors of the New York Central, and he with Messrs. Marvin, Kennedy and Baylis are supposed to be "Vanderbilt" men, as, probably, Messrs. Courtright and Wm. L. Scott might be also, as they are directors of a "Vanderbilt" company. R. P. Flower, is, we believe, a relative of Mrs. Henry Keep, and held her proxies. It is not necessary to tell who John F. Tracy is. It was his plans and combinations which prevented the "St. Paul" party from obtaining full control of the Northwestern at this time, and, probably the operation of its lines in the interest of the Milwaukee & St. Paul corporation. The successful party is known as the "Tracy" party, and its success doubtless means that the Northwestern and the Rock Island will act harmoniously—at least will not fight each other—hereafter. There is little occasion for them to be antagonistic. They have but two points in common on their lines—Chicago and Council Bluffs—and the through business between these two places is an inconsiderable portion of the entire revenue of either company. Lately the Northwestern has, in connection with the Rockford, Rock Island & St. Louis Railroad, competed for the business of Rock Island, Davenport and Moline. This competition has been provoking, doubtless, but not very formidable. We may expect to see it given up now, and the Rockford, Rock Island & St. Louis road is likely to be the chief loser thereby.

Those who have prophesied the consolidation of this road and the Rock Island with the "Vanderbilt" roads will find much to support their predictions in this election. There has never been before so large a representation of known Vanderbilt men in either directory, and when we consider that it was only by a combination of all opposing elements that the St. Paul party was defeated, we may reasonably suppose that the Tracy party will do something for Vanderbilt since Vanderbilt has done something for it—much for it—indeed, made its success possible and actual. That is, we do not suppose that the several stockholders united in support of that party out of pure love for Tracy or pure hatred of Mitchell, but that they had their several interests in view also. It is not impossible that the new board could most truthfully be called a "Vanderbilt" board.

If it is true that Vanderbilt has control or will soon obtain control of these corporations, it is the heaviest blow he has ever dealt the Pennsylvania Company. It would leave it virtually without a feeder in Chicago; for the traffic from the Chicago, Burlington & Quincy is naturally attracted to the Michigan Central, and the Chicago & Alton and the Illinois Central bring traffic from the south across several lines operated in the interest of the Pennsylvania. If the traffic of the Northwestern and the Rock Island should be directed over the Lake Shore road, the managers of the "Joy" roads would be compelled in self-defence to send all their business over the Michigan Central, and the Pennsylvania could get very little freight shipped through to the East from points west of Chicago. In this view of the matter the report that the Pennsylvania Company is ready to undertake the construction of the projected "Chicago & "Northern Railroad," seems less improbable. It is not likely to leave its magnificent lines from Chicago without connection to the West and Northwest.

However, there is a difference between "control" and "consolidation," and the extension of Vanderbilt influence in these companies indicates what may be hereafter rather than what will be this year or next.

There was but one ticket voted for at the election, the St. Paul party not appearing. The votes of 329,017 shares were given to the successful ticket. The total number is, we believe, about 460,000, so that, if we consider all the shares not voted as belonging to the St. Paul party, it is seen to represent but about two-sevenths of the capital, and with a minority representation it would have had only five out of the seventeen directors.

We are glad to see that the laws of Illinois and Wisconsin providing for a classification of directors, so that only one third shall hereafter go out of office each year, was adopted at this meeting in an honest, honorable way; that is by a vote of the stockholders, and not by the directors voting to extend their own terms of office. The resolutions to that effect were offered by Mr. Ten Have, of Amsterdam, Holland, and are as follows:

Resolved, By the stockholders of the Chicago & Northwestern Railway Company, in their annual meeting assembled in Chicago, on June 2, 1870, that said company does hereby accept, as an amendment to its charter, for the purpose of making the same a component part thereof, a certain act of the Legislature of the State of Illinois, entitled "An Act to Provide for a General System of Railroad Incorporations," approved November 5, 1849, and which empowers the Board of Directors to divide its Board into three classes, numbered consecutively, the term of office of the first class to expire on the day of the annual election; the second in one year, and the third in two years thereafter. At each annual election, after such classification, the stockholders shall elect for a term of three years a number of directors equal to the number in the class whose term expires on the day of such election. Also, that the company accept an act of the Wisconsin Legislature similar to the above, and authorizing and empowering the Board of Directors to make the classification provided for in the said two acts—dividing the said board of seventeen directors into three classes—the first class to consist of five, the second of six, and the third of six.

Resolved, That the President and Secretary of this company are hereby authorized to file a certified copy of this resolution in the offices of the Secretaries of State of Wisconsin, Illinois and Michigan.

These resolutions were adopted by a unanimous vote of the stock voting. They insure the control of the road with the present party for two years. Only five directors will be elected next year, and six the ensuing year.

The following resolution of approval, offered by John M. Burke, was passed:

Resolved, That the acts and doings of the Board of Directors of this company during the year ending June 1, 1870, in the indorsement and guarantee of the bonds of the Winona & St. Peter Railroad Company, in the amendments and modifications of the line of the Chicago, Iowa & Nebraska Railroad Company of Iowa, as the same are contained in the amended lease, dated December 10, 1869; in the construction, purchase and sale of rolling stock; in the sale of securities, stock and bonds of other companies owned by the company; in the issue of capital stock upon the surrender of the convertible bonds of the company; in the issue and sale of the bonds and stock of this company; in the contracts made with the Northern Pacific Railroad Company, and with the St. Paul & Pacific Railroad Company, are hereby approved, ratified and confirmed.

The meeting of the Board for the election of officers was held last evening, after THE RAILROAD GAZETTE had gone to press.

THE BALTIMORE & OHIO RAILROAD AND CHICAGO.

The line between Chicago and Pittsburgh which Mr. Garrett, President of the Baltimore & Ohio Railroad Company, proposes to build as a connection between Baltimore and the Northwest is as follows, the distance by air lines being given between the points mentioned:

From Pittsburgh its course will be north by west to Newcastle, Pa., a little east of the line of the Cleveland & Erie Railroad. This section will be 47 miles long. At Newcastle it will turn westward and continue in that direction 58 miles to Akron, dividing the territory between the Fort Wayne road and the Atlantic & Great Western. In this distance it makes a northing of only five miles. From Akron its course is due west to Tiffin, a distance of 83 miles, which is already graded. From Tiffin it is proposed to build an air line to Chicago, about halfway between the Lake Shore and the Fort Wayne lines, crossing the west line of Ohio near the northwest corner of Paulding county (85 miles from Tiffin). Thence to Chicago the distance is 160 miles. This gives the total distance between Chicago and Pittsburgh as 433 miles, no allowance being made for curves or deflections from straight lines between the places mentioned. This is 35 miles shorter than the Pittsburgh, Fort Wayne & Chicago Railway. Probably the road completed would be just about as long as the Fort Wayne line. This route is perhaps as well located as is possible, in relation to other railroads, dividing the distances between parallel lines in such a way as to secure the most local traffic possible, and passing through some considerable towns.

In connection with the Toledo & Lexington road, now in course of construction, which it would cross at Tiffin, and with the Sandusky, Mansfield & Newark, which it would cross at Centerton, the proposed road would give the Baltimore & Ohio a shorter line to Sandusky and a new line by a pretty direct route to Toledo, and enable it to share largely in the business between Pittsburgh and these two lake ports. It would, indeed, be as well placed on the great lakes as its great rival, the Pennsylvania Railroad, now is, touching it at three points, as the Pennsylvania now does, Chicago in common with it, and Toledo and Sandusky in place of Cleveland and Erie. It would seem that the Baltimore & Ohio, since it has had possession of the Sandusky road, has awaked to a sense of the importance of the business from the lakes, and is now fully determined to put itself in position to secure its share of it, and especially to encourage the commerce between these lakes and the South, with which its relations are intimate.

Hitherto the Balimore & Ohio has not cultivated New York traffic. It has made it its business to carry to Baltimore, and with all its extensions it has not made any attempt to obtain outlets to New York, whither a large part of the business of its lines is sure to go. But this last line, if built, will offer such advantages as part of a through line to New York that it seems unlikely that they will be thrown away. Newcastle, which by this route will probably be about 410 miles from Chicago, would afford an excellent starting point for a railroad to New York. By building about half-way across Pennsylvania a point might be reached whence roads already built would afford an outlet to New York. The distance from Newcastle to New York would probably be no greater than the distance from Pittsburgh by the present route, and it might be less. Thus a route from Chicago to New York would be found probably not more than 850 miles long. This could only be done, it is true, by constructing a very difficult line through a mountainous country. That such an additional line between Chicago and New York is needed, we do not say, and we do not think. Doubtless if one road had all the through business it could do it all and do it cheaper than three or more. What we do say is, that if the Baltimore & Ohio constructs this new line to Pittsburgh it will have such advantages for New York business, and so large a part—so nearly all—of the business from the lakes will insist on going to New York, that the company will probably find it to its interest to complete a short route to that city, when once it has such a line more than three-quarters made.

—A letter from New Orleans to the St. Louis Merchants' Exchange says that capitalists at New Orleans "are now in negotiation for three steam grain and cotton vessels of 2,000 tons burden each, drawing but fifteen feet of water when loaded, and are assured of others sufficient to form a tri-weekly line" to Europe.

RAILROAD MAPS.

It was in connection with this subject, we believe, that one of our contributors quoted, very pertinently, Falstaff's exclamation, "How this world is given to lying!" And it is strange, truly, that men should say clearly and directly by means of printed maps what the most unscrupulous of them would not venture to say less clearly, in so many words, spoken, written or printed. A passenger agent's map usually tells us that there is no straight road but his road, and that his road is the ideal "air line," with no deflections to reach towns or curves around hills and mountains. The object in every case is to deceive—to obtain patronage on false pretenses.

It cannot be expected that a cheap map, intended perhaps, as a hand-bill, will be made minutely accurate, or that it will contain all the information desirable. We do not find fault with the want of completeness, but only with the want of honesty—the intentional falsification.

Examples of such maps are common, but the most flagrant example we have ever seen is a map of Chicago, published in St. Louis, and intended to show the relations of different and rival lines in this city.

In that map, no less than four blocks are shown between Market street and the South Branch, whereas Market street is but a few feet from that stream. This removes the depot of the rival line to a considerable distance from the centre of business and the principal hotels. The rival road is shown as pursuing a tortuous course from its depot out of the city and crossing, not far from the depot and where business is active, five draw-bridges, four of which are over wide bayou-like streams. The inhabitant of Chicago is puzzled at first to know what these streams in the neighborhood of Harrison, Polk and Taylor streets mean. If he will look about two miles further up he will find that the road in question does cross a *slip*, and a mile or so further down it crosses another, and pretty well out on the prairie above Bridgeport it crosses a branch of the South Branch. As the bridges appear in the map, they seem likely to be formidable obstacles to an entrance into the city; something which travelers are not likely to discover otherwise. There are many other distortions and misrepresentations on this map; Twenty-second street being placed more than a mile further north, even below Twelfth street, and the embryo Pacific Hotel shown as covering the site of the Tribune building and McVicker's Theatre. The mistakes are not what we complain of, it is the deliberate misrepresentations.

Such a map in Chicago, or with people familiar with Chicago, would tell strongly against the road for which it was used. It can influence only those who are ignorant of the locality, and then only by deceiving them. It may be urged that no one is injured by such deception, because the route recommended is really an excellent one, and the traveler who passes over it will have no cause for complaint. He will have abundant cause for complaint, however, if he retains his map as a guide through Chicago. Having once tried it he would hardly put much faith in the circulars of that road thereafter.

Another railroad map issued this week by the Chicago, Burlington & Quincy Railroad Company is as conspicuous for truthfulness as the one just mentioned is for misrepresentation. We have spoken of it elsewhere, but we cannot recommend it too highly as a sample of manly and honest advertising. Such a map, to one who knows anything of the country represented, gives confidence at once in the company and in its representations. And, moreover, the map is valuable for its accuracy, and on that account likely to be carefully preserved and frequently referred to, and thus remain for a long time an excellent advertisement of the road.

Another map, conspicuous for exactness and admirable for execution, is one used by the Pennsylvania Railroad Company, the Camden & Amboy, and, we believe, many other railroads of New Jersey and Eastern Pennsylvania. The railroad system in these sections is most complicated, and it is with great difficulty that roads can be traced on an ordinary map. This, we believe, was not made for any particular road, but was intended by the author for general circulation. It is entitled a "Map of the Railroads of New Jersey and Part of the Adjoining States," and it includes all the lines from a point a few miles east of New York far enough west to include Wilkesbarre and Hazleton, Pa. It is the execution of this map which we desire to notice particularly. It shows the railroads in *red* lines, thus making them very distinct and easily followed. The distances between stations are given in miles and tenths of a mile, and no towns except such as are railroad stations are shown. There are light dotted lines for county boundaries, and the names of counties and of streams are given; but the map is nowhere crowded, and it is easy to find each name and the place to which it belongs. We commend this as a model for railroad map makers, and hope it will be imitated. Its adoption by railroad companies, and especially the publication of an accurate map by the Burlington road, shows that the time has come when some railroad men dare to solicit business in a straightforward and honest manner.

New Through Lines to New York.

The New York Central has hitherto had but a small share of the Ohio river passenger business. But is now preparing to bid high for the travel to and from Cincinnati, Louisville, and also of St. Louis. A line of sleeping cars running through between Louisville and New York was put on last week. This runs over the Jeffersonville, Madison & Indianapolis from Louisville to Indianapolis; the Cleveland, Columbus, Cincinnati & Indianapolis to Cleveland; and thence by the Lake Shore & Michigan Southern and the New York Central & Hudson River. This week, we hear, a through line from St. Louis, running from Indianapolis by the same route, and to Indianapolis over the St. Louis, Alton & Terre Haute and the new Terre Haute & Indianapolis road. On the 16th, it is reported that a through line from Cincinnati will be put on running to Cleveland by the Cleveland, Columbus, Cincinnati & Indianapolis, and thence as before. To do this the consent of the Pennsylvania Railroad is necessary, as the cars must pass over their leased line from Columbus to Cincinnati. These cars would compete directly with the Pennsylvania for New York travel, but as the distance by way of Cleveland is about 140 miles further, perhaps the Pennsylvania Company is not afraid of the competition.

The Rock Island Election.

So much attention has been absorbed by the Northwestern election that the choice of directors of the Chicago, Rock Island & Pacific Railroad has attracted comparatively little notice. The election took place last Wednesday (June 1), and resulted in the choice of the following board:

David Dawes, New York.	Wm. L. Scott, Erie, Pa.
Francis H. Tows, New York.	John Hearn, Erie, Pa.
Anthony G Dulman, New York.	John F. Tracy, Chicago.
Charles R. Marvin, New York.	Henry H. Porter, Chicago.
Robert A. Forsyth, Newburg, N. Y.	Ebenezer Cook, Davenport, Ia.
Milton Courtright, Erie, Pa.	Geo. L Davenport, B. F. Allen, Des Moines, Ia.

This is the board elected a year ago, with two exceptions. Wilson G. Hunt and O. De Forest have been replaced by Francis H. Tows and Anthony G. Dulman. (Both Mr. Grant, and Mr. Hunt, we believe, died during the year.) Six of this board, as we have said elsewhere, were elected the next day directors of the Northwestern. Two of them, Courtright and Scott, are directors of the Lake Shore Company.

The directors will organize to-day by electing officers.

Penalty to Engineers for Killing Stock.

The Kentucky Legislature at its last session passed the following law, entitled "An Act to provide for the punishment of railroad engineers for wilfully killing or crippling stock":

Be it enacted by the General Assembly of the Commonwealth of Kentucky, That where any railroad engineer shall wilfully and torturingly, or by reason of gross negligence, kill or cripple any live stock, by any train of cars or locomotive in his charge or under his control, he shall be guilty of a misdemeanor, and upon conviction thereof shall be *fined*, not less than *ten dollars* nor more than *two hundred dollars*, or *confined* in the *county jail* not exceeding *three months*, or *both* so fined and imprisoned, at the discretion of the jury.

2d. This Act shall be given in charge of the Grand Jury at the beginning of the term of each of the Circuit or Criminal Courts of this Commonwealth.

3d. This Act shall take effect sixty days after its passage.

—The Chicago, Pekin & Southwestern Railroad is steadily "marching on." A Howe truss bridge of two spans, each 128 feet long, has recently been completed, 50 feet above the bed of the Big Vermillion River. Another bridge of five spans, 128 feet each, is immediately to be placed across the Illinois River at Marseilles, the piers for which are already in position and ready for the superstructure, and the timbers on the ground. The work of grading is going rapidly forward, and many deep cuts and heavy fills have been made in the bluffs on the south side of the Illinois River. Many people get confused in reading of "Southwestern Railroads." This road is entirely indedendent of any other road in existence, and has nothing to do with the road now being built connecting with the Chicago, Rock Island & Pacific, and called the Chicago & Southwestern.

—Last Saturday in St. Louis, the Circuit Court judges in general term gave a decision in the case of Hickman N. Robbs vs. the Chicago & Alton Railroad Company. The plaintiff had sued the defendant for $1,000 damages for the killing of four horses by a locomotive, and the Circuit Court had dismissed the suit for want of jurisdiction. This judgment was yesterday affirmed, the Court holding that it had no jurisdiction, because the principal office of the company was at Chicago.

Chicago Railroad News.

Pullman Pacific Car Company.

This company is now running regularly on the Pacific railroads two hotel trains weekly between Omaha and San Francisco, leaving Omaha Tuesdays and Thursdays. All the cars on these trains are Pullman cars, and Passengers obtain their meals on the trains. The fare by this train is $110—but little higher than by the other trains. A double berth between Omaha and San Francisco costs $18. The company is ready to charter cars for excursion parties at almost any time.

Penalty for Obstructing Trains.

In the Superior Court, last Tuesday, Thomas Johnson was found guilty of obstructing the track of the Illinois Central Railroad, near Matteson, by placing eleven ties across it in advance of an approaching freight train. He is to spend two years in the Penitentiary as the reward of his villainy.

Allentown Line.

There are now two trains daily by the Allentown Line to New York. The fast express, leaving Chicago at 11 in the forenoon, arrives in New York by this route at 6 in the afternoon of the next day; and the train leaving at 9 in the evening, having a Pullman car attached which runs *through*, lands its passengers in New York at noon on the second day. Both trains make close connections for Boston.

Pullman Palace Car Company.

Some of the new cars of this company are painted on the outside in bronze-green with crimson and gold imitation. This style, we hear, will be adopted hereafter in all the cars built or repainted for the company in place of the claret color which has been used heretofore and which is known all over this country as the standard of the comforts which the Pullman cars provide.

Work on a train of six cars for this company has been commenced lately at the Aurora shops. Of these two are hotel cars, one a commissary car, one a drawing-room car, one a smoking and one a baggage car.

Chicago & Alton.

An important change of time was made on the St. Louis line last Sunday, extending to all the trains, and in some cases making a difference of two hours in the leaving time.

The leaving and arriving times by this arrangement are as follows:

	Leave.	Arrive.
Express Mail	*8:10 a. m.	*8:00 p. m.
Joliet Accommodation	*4:40 p. m.	*9:40 a. m.
Night Express	†6:00 p. m.	§6:00 a. m.
Lightning Express	‡9:50 p. m.	*8:30 a. m.

*Except Sundays.
†Runs through to St. Louis every night.
‡Saturdays and Sundays excepted.
§Except Monday.

By this schedule the express mail leaves at 8:10 in the morning instead of 10 o'clock; the Joliet accommodation forty minutes later than heretofore; the night express at six in the evening instead of 7:05, and the lightning express at 9:50 instead of eleven o'clock at night.

The negotiations for the lease of the Louisiana & Missouri River road are still pending. Mr. Blackstone has gone to the East to make some arrangements concerning the business.

The traffic is unusually good at the present time. Grain is coming forward freely, and there is a heavy movement of live stock.

The earnings for the last ten days of May were:

1870	$110,782 82
1869	96,949 26
Increase (14¼ per cent.)	$13,880 56

Chicago, Burlington & Quincy.

We desire to call attention to the very excellent and *truthful* map which has been prepared by the General Western Passenger Agent of the road Mr. E. A. Parker, and just published by the company. It is especially worthy of commendation for its truthfulness, a virtue so rare in railroad maps that the observer is likely to be so astonished that he will forget to note that the map is also very full and very accurate, giving all the country between Buffalo and Omaha, with *all* the the railroads, not omitting and not distorting competing lines, and all the principal stations, and showing every county and every township. This is a map which ticket agents everywhere will value. They will find it very convenient for reference, as there is hardly a station in the district covered by the map which cannot be found on it, and by it the routes of travelers can be readily traced. As all the "Joy roads" west of Chicago are prominently marked on the map, it will advertise them all equally, and it will doubtless become a necessary piece of office furniture at every station on these roads, and, we doubt not, at many on other roads.

Mr. Parker's office at No. 63 Clark street is doing a good business, and obtaining much travel which would not otherwise reach the road. Residents in the city and travelers should remember that there, just opposite the Tremont House, they can obtain tickets as well as at the depot. Excursion tickets for Riverside are also sold there—and in great numbers.

A train of nine Pullman coaches, containing 297 teachers from California, arrived in this city from San Francisco, last Thursday, passing over the Burlington & Missouri River Railroad and this road on the way from Omaha.

The annual meeting of stockholders for the election of directors will be held in this city on the 29th inst.

Maintenance and Renewal of Rolling Stock.

The following is an abstract of a paper prepared by R. Price Williams and lately read by him before the British Institution of Civil Engineers:

The author began by stating that the experience now possessed, extending over nearly forty years, enabled the average life of each individual part of a locomotive and of other rolling stock to be accurately ascertained. Tables were submitted, based on data furnished by several engineers, showing in minute details the average lives and the net cost of the several parts of an engine and tender of recent construction, and thence by calculation the mean money life of the whole structure was determined. It was shown that the lives of the different parts of the engine varied considerably from the brake-blocks and other small items, which required to be renewed every six months, to the side frames, plain axles, and other parts, which lasted thirty years. The first series of extensive renewals, which occurred at intervals of five years, consisted chiefly of the replacement of the brass tubes, and amounted during the period of longest life, or thirty years to 973*l.* The renewals of the crank axles followed in periods of six years, and cost, during the whole thirty years, 256*l.* The great bulk of the renewals, however, took place at intervals of seven and ten years, and included the engine tyres, boiler, firebox and other costly portions, amounting altogether to 2119*l.* at the same period. The whole net cost of the renewals in thirty years amounted to 4890*l.* equivalent to an average cost of 163*l.* per annum. The total net cost being 1788*l.*, it followed that the mean money life* of an engine and tender of this type was 10.97 years, or practically eleven years. If the number of miles run were taken as the measure of life, and if 20,000 miles per engine per annum were assumed to be a fair average performance in steam, it followed that when an engine had run 220,000 miles, an amount would have been spent upon it in repairs equal to its first cost.

It was proposed to divide the life of each part of an engine into four periods, called New, Good, Indifferent, and Bad, respectively, and to obtain certain numerical co-efficients from which to ascertain the mean value during each of the four stages. In estimating the value of anything subject to wear and tear, it was the usual custom to take half the net cost as the mean value which was equivalent to assuming that the rate of dilapidation was uniform. The author, however, pointed out that this was far from being the case, the rate of dilapidation being usually slow at first, and increasing rapidly towards the end. In the one case the running value of the engine at any time during its life would be represented by the ordinates of a straight line, commencing with the initial cost, and decreasing at a constant rate down to nothing at the end of the life; in the other case, the value at any time would correspond to the ordinates of a curved line, which would always be above the straight line of uniform wear. It was proposed, as an approximation, to assume the simple hypothesis of the dilapidation increasing as the square of the time, when the curve alluded to became a parabola, and the mean ordinate, or average running value, two-thirds of the initial cost. As regarded the periods of time, in terms of the whole life, to be assigned to each of the four stages, New, Good, Indifferent and Bad, in the first place one-tenth of the life was allotted to each of the periods, New and Bad, and for the intervening portion of Good and Indifferent, since the results of experience tended to assign a longer period to the former than to the latter, five-tenths, or half the whole life, had been allotted to the period called Good, leaving the remainder of three-tenths to the stage of Indifferent. With these assumptions the mean value of the engine, during each of the four stages, became as follows:

New	0.993
Good	0 857
Indifferent	0.430
Bad	0.096

In an engine of average condition it might be expected that there would be parts of it in each of the four states; or, in other words that a certain and definite amount of dilapidation must always be present, quite irrespective of a thorough and efficient maintenance. In accordance with the previous assumption, this normal dilapidation was found to amount to one-third of the net cost. It was submitted that the theory on which the above calculations were based must, necessarily, give a nearer approximation to the truth than the old hypothesis of uniform wear; the result, of course, was to enforce a higher standard of efficiency and to allow a less amount of normal dilapidation. From a consideration of the curve of dilapidation, it was shown that an engine which was up to the standard value might be deemed on the point of changing from the category of Good into that of Indifferent.

A diagram was exhibited representing the successive renewals required by an engine of the type previously alluded to, during the period of thirty years, or of longer life. The net running value at any time, both before and after each successive renewal, was indicated by the irregular curved line, constructed on the hypothesis of the dilapidation increasing as the square of time. The engine was shown to pass through its mean value viz: two-thirds of its net cost, at 17⅓ years or 577 of the ultimate life. Allusion was made to a paper by Mr. E. Fletcher "On the Maintenance of Railroad Rolling Stock," read at the Institution during the Session 1863-65, (vide Mid. of Proc. Inst. C. E. vol. xxiv. p. 459), from which it appeared that the average money life of the locomotive stock belonging to the North Eastern Railway Company was only eight years, or considerably below the standard given by the author. This was accounted for by the fact, as stated by Mr. T. E. Harrison, (V. P. Inst. C. E.) that a number of the North Eastern engines were rebuilt before they were actually worn out, in order that they might be replaced by engines of a different type.

A practical illustration was given of the mode of applying the tables for the purposes of estimating the running value of locomotive stock. An ideal report upon the state of the engine from actual inspection being assumed, and each part of it assigned to one of the four categories of New, Good, Indifferent and Bad, and these separate values added together, the resulting amount gave the value of the engine above or below the standard, as the case might be. The author was of opinion that similar tables adapted to the different standard types of engines and carriages might be used with advantage in the periodical stock-takings, and that by that means an accurate and reliable knowledge might be obtained of the actual condition of the rolling stock.

The results previously arrived at had been verified by a comparison with the actual cost of engine repairs on some of the leading English railways. These were illustrated by tables and diagrams, the average results being given in the accompanying summary.

The author gave, in a series of tables, the details of the running expenses on 11 of the principal English railways, of which the annexed was a summary.

COST OF REPAIRS AND RENEWALS. AVERAGE OF PAST YEARS.

RAILWAYS.	Period or years over which the average is taken	Average number of engines per mile worked	Average number of train miles per engine per annum	Average money life in years assuming £2,400 average gross cost per engine	Average cost of repairs and renewals per engine per annum	Average cost of Repairs and renewals per train mile	Average cost of repairs and renewals per standard train mile, 18,600, per engine per annum
	No.	No.	No.	£	Y'rs	d.	d.
Great Eastern	18	0.45	18.188	221.84	10.819	2.9259	2.8875
Great Northern	20	0.71	18.343	228.00	10.526	2.9360	2.8954
Lancashire & Yorkshire	18	*1.05	17.480	195.00	12.308	2.6784	2.5171
London, Chatham & Dover	6½	0.74	18.680	212.12	11.314	2.7351	2.7469
London & Brighton	20	0.67	16.873	262 16	9.155	3.7993	3.4465
London & North Western	11	*0.86	16.095	228.72	10.493	3.4510	2.9662
London & South West'n	33	0.45	21.146	272.40	8.81	3.1584	3.5907
Manchester, Sheffield & Lincolnshire	17	*0.61	19.334	267.22	8.981	3.3099	3.4405
Midland	21	0.64	18.608	275.24	8.720	3.5644	3.5659
North London	8½	1.95	19.665	256.84	6.796	4.3930	4.6434
South Eastern	20½	0.62	17.110	226.44	10.601	3.1975	2.9414

RUNNING EXPENSES. AVERAGE OF PAST YEARS.

RAILWAYS.	Period of years over which the average is taken	Average number of engines per mile worked	Average number of train miles per engine per annum	Average cost of running expenses per engine per annum	Average cost of running expenses per train mile	Average cost of running expenses per standard train mile, 18,600, per engine per annum
	No	No.	No.	£	d	d
Great Eastern	18	0.45	18 188	430 94	5 6854	5-5594
Great Northern	20	0.71	18.343	369 00	4.8538	4.7867
Lancashire and Yorkshire	18	*1.05	17.480	350.52	4.8991	4.5477
London, Chatham and Dover	6½	0.74	18 680	564 08	7.3749	7.3062
London and Brighton	20	0.67	16.873	496.76	6.9972	6 3475
London and North Western	11	*0.86	16 095	336.42	4.5481	3.9856
London and South Western	33	0.45	21.146	447 52	5.0597	5 7523
Manchester, Sheffield & Lincolnshire	17	*0.61	19 334	414 59	5 1731	5 3779
Midland	21	0.64	18.608	399.76	5.2473	5.2495
North London	8 ½	1.95	19.665	587.54	7.1663	7.5767
South Eastern	20½	0.62	17.110	403.80	5.6876	5.2323

*Number at the present time.

It was observed that the usual method of taking the cost per train mile as the basis of comparison was liable to great objection. The average cost of all locomotive expenses, including repairs, on the London and South Western, had only been 8.50 pence per train mile. This arose from the fact that the number of engines per mile of line was very small, viz., 0.45, and consequently the train mileage per engine, per annum, was very great, averaging 22,146 train miles, and in some years amounting to 27,000 miles, the average of all the other railways being about 18,500 miles. The London and North Western average had only been 16,000 train miles per annum, while the average cost per train mile was 9.32 pence. If, however, the cost per engine were taken as the standard of comparison, it appeared that the running expenses on the London and South Western had been considerably above the average, being 447*l.* per engine, as against 336*l.* on the London and North Western; while the cost of repairs per engine on these two railways had been 272*l.* and 220*l.* per annum respectively.

It was obvious that the cost per train mile and the cost per engine were equally inapplicable as a basis in comparison in either of these two cases; and the author suggested the advisability of taking a certain standard, or nominal, train mileage per engine per annum, as the divisor, instead of the actual train mileage run. In the above tables an average of 18,600 train miles had been assumed as a standard. This number, it must be borne in mind, took into account the allowance made for engines undergoing repairs: 50 per cent. only of the whole stock, as a rule, being in steam daily.

The exceptionally large cost of the coal and coke on one of the principal railways was noticed; in most cases, however, the substitution of coal for coke has led to a large reduction in this item of expenditure. The cost per train mile of the running expenses, as also that of repairs and renewals, appeared of late years to preserve a very uniform outline, which, in the author's opinion, seemed to indicate that the rolling stock was more adequately maintained than formerly, and that fair average results as regarded running expenses had been arrived at. The question of the economy, or otherwise, of working a line with a small number of locomotives, and consequently obtaining an excessive amount of work out of each engine was touched upon.

The repairs and renewals of carriages and wagons on the Great Northern, the Manchester, Sheffield, and Lincolnshire, and the North London railways, were given in a series of tables and diagrams, and the results appeared to agree very closely with those appended to Mr. Fletcher's paper, previously alluded to, as would be seen from the following summary of the results:

CARRIAGE REPAIRS.

RAILWAYS.	Period of years	Number of carriages per mile worked	Average cost per vehicle per annum	Mean money life.	Average cost per train mile	Average cost per passenger train mile
			£	years.	d.	d.
Great Northern	20	1.73	22 24	9,036	0.6939	1.5960
Manchester, Sheffield and Lincolnshire	17	†.14	20.71			1.3735
North London Railway	9	9.48	35.26	7.935	2.0193	2.8283*

*Average of five half-years. †Average of three half-years.

WAGON REPAIRS.

RAILWAYS.	Period of years.	Number of wagons per mile worked	Average cost per vehicle per annum	Mean money life.	Average cost per train mile	Average cost per goods train mile
			£	years.	d	d
Great Northern	20	17.19	4.94	14.876	1.4529	2.5978
Manchester, Sheffield and Lincolnshire	17	†16.0	4.18	17.400	1.7036	3.4178
North London Railway	9	16.7	4.83	16.903	0.5181	2.9332*

*Average of five half years. †Average of three half years.

According to Mr. Fletcher, the average cost per annum, per carriage and per wagon on the North Eastern Railway had been 22*l.* 0*s.* 9*d.* and 4*l.* 8*s.* 4*d.* corresponding to a money life of 8.9 and 15.65 years respectively.

WIND PRESSURE ON BRIDGES AND ROOFS.

Recognizing, as we have always done, and advocating as we always do, the advantages of a sound knowledge of theory, and an accurate appreciation of its value, it must, nevertheless, be admitted that there are certan instances in which it becomes absolutely impossible to reduce its dictates to practice. It is not merely the labor that it imposes on its votaries in some particular cases that acts as a deterrent, but also the uncertainty as to the result that is ultimately arrived at through its instrumentality. There are some theoretical calculations which, with all the respect we have for their intrinsic merit, do unfortunately terminate in "vanity and vexation of spirit." In such examples practice and experience come most opportunely to the rescue, and solve the problem that by reason of its complexity would otherwise remain, to all intents and purposes, indeterminate and unproven. Digressing for the moment, the pertinent question presents itself, how is it that some engineers, by an almost natural aptitude—it might almost be termed instinct—do perceive at a mere glance the fitness of any proposed design for its required duty? They make no elaborate calculations respecting the dimensions of the several parts, they do not care to inquire whether this member is a strut and that a tie, whether there are 5 tons or 6 tons per square inch upon the metal, but state at once, without the slightest hesitation, that it will carry such and such a load safely. Whence is this practical discernment derived? In our opinion it is due to natural ability and genius.

In the designing of bridges and the proportioning of their several parts, the conditions attending the development of the strains are usually determined upon the separate assumptions of a fixed and a variable, or, as it is also termed, a dead and a live load. Two tables of the results should always be compiled — the one giving the maximums strains under the hypothesis of the load being uniform and stationary, and the other, those arising from the action of the moving load in the several positions it can practically occupy. Should the latter calculation be omitted, as it sometimes is, it is impossible to arrive at the opposite duties which may be required of any particular member of the structure, and any attempt at scientific and economical counterbracing becomes impossible. The experience derived from the construction and erection of the Britannia Bridge tends to demonstrate that the pressure of the wind, so far as structures of that class are concerned, produces little or no effect upon their general equilibrium. Not that it is to be disregarded; but it cannot be considered as materially increasing the assumed load, either fixed or variable, which enters into the calculation of the necessary sectional area of metal proper under the circumstances. The resistance to wind pressure is obtained not so much by strengthening, but by stiffening a bridge or roof. Insistent and rigidity are the best counteracting elements. The type selected for a bridge considerably modifies the nature and intensity of the force of the wind. A girder with an open or lattice web will be but little affected by the most violent storm, at whatever elevation it may be placed; but if a solid-sided or plate girder be in the same situation there will be a large amount of lateral stress induced upon one or other, and perhaps upon both of its sides simultaneously. Taking one of the Menai tubes, for instance; if we imagine a strong wind blowing upon one of its sides, it may be regarded theoretically as equivalent to a temporary weight or pressure acting uniformly, or what amounts to the same uniformly distributed over its whole length. Under these conditions, it is obvious that there is a close analogy between the resulting strain and that induced upon the centre of a girder by a horizontal load. The maximum bending moment will be evidently proportional to the pressure of the wind upon the unit of surface multiplied by the square of the span, the resistance being directly as the *vis inertiæ* of the bridge and its own rigidity. The maximum pressure upon the Britannia bridge was found to be only half a

*It was explained by the term "mean money life" was meant that period during which a sum would have been spent upon the repairs and renewals exactly equal in amount to the net cost of an engine.

ton square inch. This is also apparent from the fact that although the wind may not affect a bridge throughout all its parts with the same degree of force, yet its action is never so purely local as to be confined to one particular section or short length. The tendency of a wind pressure on the side of the Britannia tube is not to shear the web in any particular vertical plane, but to sweep the whole structure bodily into the straits. In this instance any more stiffening applied solely to the side would be of little or no use. It is the whole bridge that must be rendered rigid. The two tubes are assailed *en masse;* their only safety is in a close and intimate union, combining their individual resistances so as to act as one rigid piece of construction. It was not at first intended to place the two tubes in this relation with one another, but the advantage of so doing was speedily recognized and acted upon.

A roof is differently affected by the wind to a bridge. In this respect it must be confessed the modern light iron trusses are comparatively at a disadvantage with the older, heavier type of timber constructions, which, although the absolute covering of slates, tiles, or of whatever nature it might be, was sometimes blown off, yet remained firm and unshaken. The pressure of the wind may affect a roof in three ways. It may affect it from without or from above, from within or underneath, and it may also affect it locally, or confine its action to one-half or even one-quarter of the entire principal. Let us take as an example a curved trussed roof of the type that is particularly applicable to stations, engineering workshops and manufacturing sheds, and proceed to determine in what manner allowance is to be made for the pressure of the wind, which has been observed in this country to obtain a maximum value of 55 pounds to the square foot. First for the external action. The roof being curved, it is clear that even on the supposition that the angle of incidence of the wind is constant, the angle of actual pressure will vary from the crown to the springing. But in reality the wind rarely blows in a storm at a constant angle. On the contrary, it blows at all angles from the vertical to the horizontal, and, in consequence, will be sometimes vertical, sometimes normal, and sometimes tangential to the surface of the roof. The assumption that the pressure of the wind may be considered as a vertical force, and that therefore so many pounds per square foot may be added to the weights already estimated to rest upon the structure, is erroneous, for in that case it would affect each half of the roof equally and simultaneously. Under these circumstances, therefore, it would be equivalent to simply increasing the uniform load, and regarding the principal as subjected only to a load of that character which is incorrect. It is true that a roof is not acted upon by a movable load in the same manner in which a bridge is affected; but it is subject to a variable load, which, as it has been already stated, may cover the half or the quarter of one side. At whatever angle the wind might be assumed to act, it is scarcely possible that its influence could be spread over a less space than one-quarter of the half, or one side of the roof. Sir W. Fairbairn observes that, in reference to roofs, "every pair of principals composing such structures should be self-supporting, that is, should have sufficient stiffness within itself to sustain a load of 40 lbs. per square foot." This load is considered to be a uniform load. How, then, is the variable pressure of the wind to be taken into account? In the first place, it must be borne in mind that 40 lbs. per square foot is considerably in excess of the actual weight of the covering and the roof itself, and includes a certain allowance for wind pressure. The largest slates weigh but a trifle over 8½ lbs. per square foot, so that the margin that is left can be well imagined, more especially as in the examples to which allusion is made a much lighter covering than slates is usually adopted. In addition, there is also the additional guarantee of security afforded by the ratio of the working or safe load to the ultimate strength of the material. Instead, therefore, of treating this weight of 40 lbs. per square foot, or whatever other unit, not less than this, that may be anopted, as a uniform load, it should be treated as both a uniform and a variable load. In other words, the effect of each successive portion of this or a greater weight situated at each apex should be carefully ascertained by a diagram of strains, and the results tabulated. The one will give the strains due to a uniform load, and the other that due to a partial one. The latter will indicate the local action of any particular weight or weights, and will point out how, under certain conditions, particular parts of the truss which are under either compression or tension, when subjected to a uniform load, will undergo strains of an opposite character when that load is regarded as only partially distributed. Having, therefore, ascertained the conditions of strains due to a uniform load upon the various parts of the roof, and tabulated the results, let another table be compiled showing the effects of a partial loading, and then the necessary counterbracing can be introduced. But there yet remains a very important element of stiffness to be added, namely, the wind ties. These are required, not only to assist in resisting the external violence of a storm or hurricane, but also to prevent the pressure from underneath literally "blowing up" the roof. If the wind once gets "well under" a roof nothing but the fact that the greatest care and precaution have been bestowed upon its bracing will prevent it being carried away. We have known an instance in which, from want of attention to the proper tying together of the principals, the whole roof was lifted bodily off the side walls and landed in an adjoining field. The storm continuing, the walls gave way also, and the cost of restoring matters to their original condition amounting to £1,500. The fault of most wind ties is that they are not carried down low enough. There is no necessity for tying the principals together with wind ties. They are already amply secured by the purlins and the whole covering in general. The point to be aimed at is to tie them back upon the respective supports, so that the principals could not be lifted without taking the foundations with them. Basing our estimate upon the data already assumed for the maximum pressure of the wind, the upward force would be equal to 55 lbs. per square foot, and would consequently lift nearly that weight vertically. Unless therefore, the insistent weight of the roof per square foot were greater than this amount, it would at any rate be able to be seriously shaken by a force of that intensity. The aid, therefore, of some further mode of securing the principals is evident, as roofs of moderate, and even large spans, do not equal in weight the figures arrived at by observation for the maximum wind pressure. The strength required to be given to a roof will be most accurately calculated by due attention to those principles which theory dictates and practice sanctions; but its rigidity and stiffness will be best provided for by experience, combined with a little of that "artifice" which every thoroughly qualified engineer knows when and how to employ.

Holding Engineers Responsible for Damages.

A correspondent of the *Locomotive Engineers' Journal* writes as follows on the above mentioned subject:

Another rule similar to the one just noticed, which the management of some roads are assiduously laboring to establish, is to levy the damage on machinery by accidents on the road to engineers and conductors of the trains injured, and it is to be hoped that this rule is not supported by the stockholders of any road in this or any other country. Now, I conceive this to be a matter not only for railroad companies and their employes to consider, but one of vast moment to the patrons of railroads. I think there has never a case of the kind been brought before the courts, and consequently this must be viewed by its appearance; must be supported on the strength or merit of its reason and justice, or fall from its injustice and demerits.

A rear collision occurs; the case is investigated; it is found the rear section, on the road between stations, is one or two minutes ahead of time, and hence the engineer is liable for damages. Now let us suppose a case: The engineer, with a heavy train, and as is often the case, a wheezy old engine, leaves a station and is anxious to make time; he has a mile down grade, and a mile beyond, up grade; if he stops in the hollow is surely stuck, so runs beyond the maximum speed down the grade and gains two minutes and is one minute ahead of time, but at the top of the next grade is again behind time. Now it so happens that at the foot of the grade, around the curve, is the first section stuck and no flag out; he is one minute ahead of time, and is liable for damage. Perhaps correct in theory, looks well to the man that never run a train, but is a *very fine* line in practice. Another does some injury to cars, must pay damage or quit; claims it was an accident, but owing to individual circumstances, pays the bill and continues his engine. We do not pretend to say that these men were or were not to blame, but that if they were not, they should not pay damages; if they were incompetent that they should be discharged; that it is a rule that must work to the injury of good men; for in case of any rule where the question is to be decided by one party, there is very rarely justice done the other. But say the management, these are competent men, but got a little careless, and we wish to sharpen them up by a fine of fifty or a hundred dollars. Now I would ask, is it the pure metal that wants constant burnishing? the fine instrument that needs constant whetting? if man is dull, or ignorant, or careless, will a few dollars change his nature or educate him? If these men are incompetent, all men on the road are in danger from their incompetency, and a few dollars paid the company will not insure them from accident from these men's incompetency. But the question does not rest here. Railroad companies are common carriers, and as such are bound by common and statute law to use all care and diligence in the power of man to exercise, in the transfer of person or property, and if they knowingly omit any precaution, as retaining in their service incompetent servants, are liable to the full extent of damages; and in the case of passengers, if injured or killed by the acts of such persons, the management have been imprisoned for such acts. Now let us bring a case, for brevity sake, before a court. In case of accident the officer of the road is called to testify before a jury, and the following questions are asked:

Are you officer on —— road? Did you have in your employ Mr. ——, an engineer? I did. Did you consider him a competent man? I did. Was he running the train when the accident occurred? He was. Had he been on the road for some time? He had. Did he have an accident on the road at such a time? He did. Did you collect one hundred dollars damages at that time from him? I did. If you considered him a competent man, why did you collect damages from him? I considered he was dull or careless.

Now I believe any jury would consider this *prima facie* evidence of the man's incompetency, and that the company knew it; for if the man was not to blame he ought not to have paid damages. The assessment of damages in this case supposes guilt, and I conceive it would matter but little in the finding of a jury, whether the man was incompetent from ignorance, carelessness, or drunkenness, so it was known and acknowledged by his employer.

I believe that that the people that have voted the lands and money of the country so liberally, are entitled to demand at the hands of the management of roads, safe and trusty men to run the trains upon which they pay fare, and that the time is not far distant when railroad engineers will have to, like steamboat engineers on government and ocean steamers, be examined by a competent judge, and any road hiring others will have to pay the penalty.

—A verdict was rendered on the 30th ult. in the Supreme Court of New York, in the case of Tracy E. Roberts, against the Toledo, Wabash & Western Railroad Company, in which plaintiff claims $100,000 damages on account of a dislocation of the hip while traveling on the line in 1864. The jury awarded plaintiff, who was traveling on a pass at the time of the accident, damages to the amount of $6,000.

NARROW GAUGE RAILWAYS.—THE FAIRLIE ENGINE.

The object of the experiments on the Welsh railways was to ascertain whether or not the Fairlie engine increased the carrying capacity of a railway or diminished the cost of working it. With this view two engines were put on their trial—one, the Little Wonder, on the Festiniog Railway, of 2 foot gauge, in North Wales; the other, the Progress, on the ordinary gauge of 4 ft. 8½ in South Wales.

The Fairlie engine consists of one long boiler, having two sets of tubes, with double firebox between, and poised on two bogies. The arrangement is such that an enormously increased power is gained, with an extraordinary facility of movement upon swift curves, and with a freedom from oscillation which makes the Fairlie engine less destructive to the rails than locomotives of much less weight and power. The value of the system depends chiefly on two bogies. It may be necessary to explain for some readers that a bogie is simply the name of a small truck. Instead of resting a wagon or a locomotive upon wheels of its own, which would make a long wheel-base that could not by any possibility get round very sharp curves, and that might get round moderate curves, but only with an amount of flange friction destructive to the rails and retarding speed, wagon the or locomotive is poised on two independent trucks, which have a short wheel-base, and which can, therefore, find little difficulty in curves of exceeding sharpness. In the small cabbage-garden at Hatcham, half an acre in extent and laid out with rails of the ordinary gauge, Mr. Fairlie exhibits a steam carriage of 43 feet in length traveling at a speed of 25 miles an hour round curves of 50 feet radius; and they couid with equal ease, and even greater safety, travel round curves of 25 feet radius, which is only about that of an ordinary engine turntable. The engine, therefore, on a pair of bogies is prepared for a circuitous line of country, even on the standard gauge which engines of the current type could not attempt.

Excellence of the bogie, however does not merely consist in its adaptation to curves. It has an extraordinary effect in reducing oscillation. An ordinary carriage rests directly upon the ends of axles, and when through any defect in the road, there comes a disturbance in the plane of movement, the carriage, wagon, or locomotive rocks from side to side with immense violence in a series of oscillations that hammer the rails to their destruction. It is calculated that these oscillations in a train going at the rate of 30 miles an hour add more than half as much again to the normal weight upon the wheel; and this is very serious in the wheels of a locomotive, each of which may be loaded up to seven or eight tons. The oscillation is reduced to a *minimum* by means of the bogie, inasmuch as the vast superincumbent weight of the locomotive is balanced on a pin, called the bogie-pin, in its centre. The bogie is a flat table upon wheels, with a great pivot in the middle of it. This table, and the wheels which support it, must naturally submit to whatever deflections there may be in the road, and so far it is impossible to get rid entirely of oscillation; but the great mass of weight above, being poised in the centre of the bogie and upon the centre of the roadway, is comparatively free from the influences of rocking, and transmits little or no hammering to the rails. A child can understand this by watching at see saw the difference between placing a weight in the middle of the plank and dividing it between the ends. Now it is an enormous advantage thus to steady the locomotive, to reduce the tendency to oscillate, and to get rid of the violent impact upon the rails. To steady the locomotive is to make its motion safer, and to diminish the chances of its leaving the rails—a point of considerable importance on the narrow gauge. The most important point of all, however, is to save the rails, which are so perishable under the demands of a heavy traffic that there are instances in which the strongest steel rails have to be replaced in six months. The rails, where the line has any curve, are torn up by the flange-friction of monster engines with an immense wheel-base, and, whether the line is curved or straight, are hammered out by the oscillations of the same engines. We have already explained how in the Fairlie engine, the flange-friction is reduced by the substitution of bogies with a short wheel base for the old plan which necessitates a long one; and there is an absolute unanimity of opinion as to the disappearance of oscillations with the use of the double bogie.

We have only one word more of preface before we proceed to state what were the experiments with the Fairlie engine, both on the narrow and on the broad gauge. It is that the statements we were about to make do not rest solely on our authority. The various Commissioners and other obervers met together under the presidency of the Duke of Sutherland, compared their notes point by point, and came to a perfect agreement as to the facts which they were prepared to vouch for. Our facts, therefore, have the authority of documents signed by the Duke of Sutherland, as chairman of the different meetings which were held; by the Russian Imperial Commissioners; by the Commissioners of our Indian Government; by Captain Tyler, of the Board of Trade, who acted as secretary, and was mainly instrumental in putting the facts into proper form; and by others who were well able to judge.

The Little Wonder is an eight-wheeled double-bogie engine of four cylinders 8 3-16 in. in diameter, with a stroke of 13 in. The diameter of its wheels is 2 ft. 4 in.; its average steam pressure is 150 lbs.; its weight is 19½ tons; its total length is 27 ft.; its total wheel-base is 19 ft.; and the wheel-base of each bogie, which practically has alone to be considered, is 5 ft. This engine was first of all made to carry from Portmadoc to Festiniog a train made up of 90 slate wagons, weighing 57½ tons; 7 passenger carriages and vans, weighing 13½ tons; and 57 passengers, weighing 4 tons—in all, 75 tons. Add to this its own weight, and we have a total load of 94½ tons. The weight, it will be seen was considerable, if we take into account the size of the engine, the narrowness of the gauge, the steepness of the gradients, and the sharpness and multitude of the curves. But

the chief point of interest in this experiment had reference to the length of the train, which was 854 feet—nearly the sixth part of a mile. A train of such a length on such a line had often to run upon two or three reverse curves, some of them with a radius as short as 1¾ chains, and it curled and doubled upon itself as it wound among the Welsh hills, so that the passengers in the front carriages could, sitting in their seats, make signals to the hindmost ones. The engine, being in full gear, took this very long train up the hills and in and out among the curves at an average speed of 14½ miles an hour, and a *maximum* speed of 26½ miles. Let us here add by way of parenthesis, in order not to refer to it again, that some days afterwards a similar train of 140 empty and seven loaded wagons, weighing in all 101 tons, and measuring in length 1,323 feet—that is, a quarter of a mile—a train so long, in fact, that there were parts of the road on which it had to run on no less than five reverse curves—was by the same engine hauled up the hills at an average speed of 12½ miles, and a *maximum* of 16½. Now, what was the result observed in wriggling along these curves? It was generally observed (we now quote almost *verbatim* from the protocal signed by the chief witnesses) that even on curves of one and three-quarter chains radius, and at a *maximum* speed, there was very little perceptible oscillation or movement on the engine or in the carriages, and by no means such as is felt on comparatively easy curves on ordinary railways. Nor must this remarkable point be forgotten—a fact almost incredible, but yet certified by competent witnesses—that the oscillation diminished as the speed increased. The speed, let it be added, is naturally less on a narrow gauge than on a broad one. Captain Tyler, the Government Inspector of railways, was at first so doubtful of the safety of a high speed on a railway of such narrow gauge and such wild curves as that at Festiniog that he insisted on limiting the company to a *maximum* speed of twelve miles an hour. Since then, however, his doubts have been so completely dispersed that he has removed all restrictions as to the rate of speed; and as a matter of fact the Little Wonder, when necessary, works up to thirty and thirty-five miles an hour.

Next day the oscillation of the Little Wonder was put to a further test, and compared with that of the other engines—the Welsh Pony and the Mountaineer—which are of the ordinary type. In this series of experiments the speed was confined to ten or twelve miles an hour on a comparatively level line, the gradient being one in one thousand two hundred; and the line was laid with rails weighing only thirty pounds to the yard, and not fished at the joints. On the Welsh Pony and Mountaineer, tank engines of ordinary type, weighing, the one ten and the other eight tons, it was found that there was a strong vertical oscillation and a lateral oscillation not so strong. On the Little Wonder, the double-bogie engine weighing 19½ tons, it was found that when riding on the foot plates there was no oscillation whatever, vertical or lateral, perceptible—only "a smooth floating movement;" and that when riding on the bogie frame there was felt a slight oscillation, though less than other engines. It is added that the oscillation of the Fairlie engine being confined to the bogie, the influence of impact on the rails from the flanges of the wheel was far less than in the case of the Welsh Pony and Mountaineer, the whole weight of these engines being in the course of their oscillation brought to bear upon the rails.

Next followed some very tedious but very interesting trials as to the comparative powers of the two classes of engine. The Welsh Pony was selected to represent the common type of engine. It is a four-wheeled locomotive, weighing 10 tons, with cylinders 8½ inches diameter, having a stroke of 13 inches, and with wheels 2 feet in diameter. It was in the first instance tacked on to a load of 50 slate wagons full of slate, weighing 123½ tons. To this add 3¼ tons for passengers and 10 tons for its own weight, and we get at the entire load of 136 tons. With this the Welsh Pony started from Portmadoc, and running along the comparative level (1 in 1,200) of the Traeth Mawr Embankment, stopped on a gradient of 1 in 85, unable to proceed further, with 160 lbs. to the square inch of steam pressure. Hereupon half the number of wagons were removed, and the load (including passengers and the engine itself) was consequently reduced to 72 tons 17 cwt. With this load it was found that the Welsh Pony could mount the gradient of 1 in 85 easily enough. Being successful with 25 wagons, the question arose could it manage more? It was then tried with 30 wagons, but on the gradient of 1 in 85 it was found that it could not start, though, since the engine wheels did not revolve, there was no lack of adhesion. Then again the load was reduced to 26 wagons, weighing (with passengers and engine) 73 tons 16 cwt., and it was found that this was the limit of the Welsh Pony's power. It started with such a load on the gradient of 1 in 85, and carried it as far as was necessary at the rate of five miles an hour—the average pressure being 150 lbs. to the square inch. If the Welsh Pony could carry nearly 74 tons up such a gradient, and with this load also start on it, what could the Fairlie engine, the Little Wonder, do? It was supposed that it ought to pull double. If the Welsh Pony could, on a gradient of 1 in 85, manage 26 wagons full of slate, weighing with all else 74 tons, surely the Little Wonder could manage 52. Mr. Fairlie said he was quite prepared for this; he would stake the credit of his little engine on its power to carry such a load; and to show that he could be generous, he even added three wagons to the load; he thought his engine could manage 55 wagons. However, as the Welsh Pony had first of all been tried with an excessive load, it was but fair that the Little Wonder should be similarly tried. A train was prepared of 72 loaded wagons of slate, weighing 138 tons 17 cwt., with empty ones weighing 43 tons 10 cwt.; and when you add to this 56 passengers weighing 4 tons, and the weight of the engine itself, 19½ tons, you have a total load of 206 tons. With this load the Little Wonder started from Portmadoc (steam pressure 165 lbs.) and passing along the level embankment, went up the gradient of 1 in 85 with perfect ease, and to the astonishment of all the visitors, who crowded round Mr. Fairlie and shook him heartily by the hand on such a triumph. His engine was warranted to do double the work of ordinary engines, and on trial it was found equal to treble the work. But then arose the question—The Little Wonder has pulled such a load up the gradient of 1 in 85, having had a good start on the level embankment: can it start with this load on the gradient itself? It was, perhaps, scarcely fair to make the trial, inasmuch as the day was wearing late, and the engine driver had, through a misapprehension, let the fire run low. Still the trial was made, and with perfect success. There is this further, however, to be added, that whereas the shorter trains were standing when they started, or attempted to start partly on a curve of 4½ chains radius, partly on a straight line, the train of the Little Wonder being much longer (it was 648 feet,) stood partly on the curve of 4½ chains radius and partly on a reverse curve of a little wider sweep, which, of course, means an increased resistance, and might be resolved into an increase of gradient. Also, let us add here, to complete the statement, what really happened four or five days afterwards, that whereas these experiments last described were intended to test the extreme power of the engines, other experiments followed to show what the Little Wonder could do, not merely in a short run, but in its ordinary daily work between Portmadoc and Festiniog. It took, for example, a train 407 ft. long, and loaded to 141½ tons from Portmadoc to Festiniog, at a *maximum* speed of 15 miles an hour and an average one of 11¼. The usual practical load, however, of the Little Wonder upon the average gradient of 1 in 92 is from 90 to 100 tons (exclusively of engine,) at from 12 to 15 miles an hour. On a level it is calculated that its power is equal to the carriage of 450 tons, at a speed of 14 miles an hour.—*London Times.*

Palace Cars in New England.

The Boston *Advertiser*, on the occasion of the departure of the Boston excursion party to the Pacific in a train of Pullman cars, explains as follows why so few roomy and elegant cars have been put on the railroads of New England:

The interest excited here by the visit of the Pullman cars naturally revives the inquiries, "Why have not our Eastern roads cars equally capacious?" One obvious reason is that when the Eastern roads were made all their structures conformed to the experience of that time, and it would be most unjust to expect that they should have conformed to any other standard. The result is that bridges are too low, platforms too high, and stations and water-tanks too near. The only alternative is to change them as speedily as may be; but here again rampant private and sometimes apparent public interests intervene, and time and great patience and large outlays are all required to sweep the obstacles away.

The experience of last week however, shows that it can be done. On the Boston & Worcester division of the Boston & Albany Railway the train of cars referred to made it necessary to raise four bridges, varying from six to eighteen inches each; and of one station—that at Brighton—about eight inches. Being up, they will of course remain. The way having been once enlarged, it can never again be lessened. Again, we hear it asked, "Why not give us cars as large between Boston and New York?" It is because the same kind of obstructions are found on a part of the route. Of course these barriers no longer exist between us and Springfield; but they are certain to continue for some time beyond Springfield unless some avenue into New York be found other than that over the New Haven road.

—One of the most exciting steamboat races that has taken place for years on the Upper Mississippi river, was that between the steamer Red Wing, of the Northern Line of steamers, and the Andy Johnson of the Keokuk Packet Company, from St. Louis to Quincy. Both boats left St. Louis on time together, at 4 p. m., May 31, and the Red Wing beat the Andy Johnson to Hannibal, twenty minutes, and to Quincy over an hour. The Andy Johnson has previously carried the "horns," and was considered the fastest steamer on the Upper Mississippi. The Red Wing is a new boat, and on this trip had a barge in tow. The Red Wing ran from Hannibal to Quincy, a distance of twenty-five miles, in fifty-five minutes.

—An election was held in Minnesota on the 31st to decide on a proposition to exchange State lands for old railroad bonds long due, which there has been a disposition to repudiate. According to the returns received it appears that the proposition is carried by a large majority.

—The gross receipts of the Union Pacific Railroad for April amount to $680,813.26, an increase of over $149,000 over the March receipts. The earnings for May will be nearly twice as great as the March receipts.

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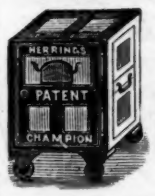

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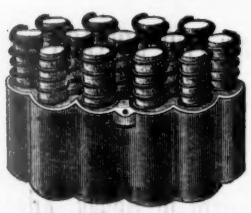

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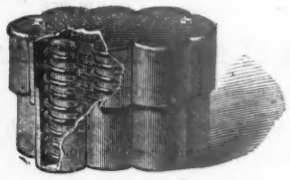

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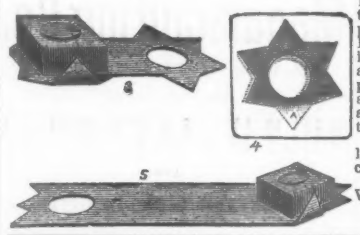

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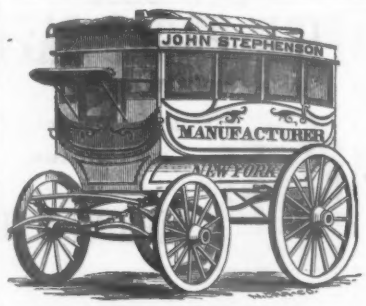


OMNIBUSES

—OF—

EVERY STYLE!

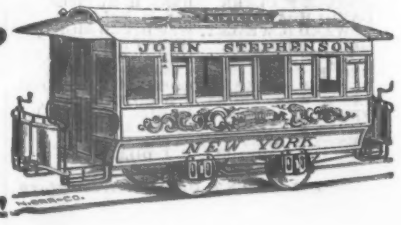
☞ Orders Promptly Filled. ☜

CARS,

LIGHT, STRONG

—AND—

ELEGANT!



GENERAL FREIGHT DEPARTMENT.

The Illinois Central Railroad

ARE PREPARED TO TAKE FREIGHT FOR

Cairo, St. Louis, Peoria,

BLOOMINGTON, SPRINGFIELD, JACKSONVILLE,

And All Points in the Central and Southern parts of the State;

MOBILE & NEW ORLEANS BY RAIL OR RIVER

And ALL POINTS on the MISSISSIPPI below CAIRO. Also, to

Freeport, Galena and Dubuque.

☞ Freight Forwarded with Promptness and Despatch, and Rates at all times as LOW as by any other Route.

BY THE COMPLETION OF THE BRIDGE AT DUNLEITH,

THEY ARE ENABLED TO TAKE FREIGHT TO ALL POINTS WEST OF DUBUQUE ☞ WITHOUT CHANGE OF CARS! ☜

DELIVER FREIGHT IN CHICAGO ONLY at the FREIGHT DEPOT of the Company, foot of South Water St. Parties ordering Goods from the East should have the packages marked:

"Via Illinois Central Railroad."

For THROUGH BILLS OF LADING, and further information, apply to the LOCAL FREIGHT AGENT at Chicago, or to the undersigned.

M. HUGHITT, Gen. Supt. J. F. TUCKER, Gen. Freight Agt.

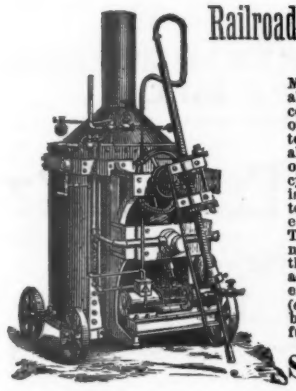
LESCHOT'S PATENT

DIAMOND POINTED

Steam Drills!

—FOR—

Railroad Grading, Well Boring, Prospecting, &c.



The unequalled efficiency and economy of these DRILLING MACHINES are fully established, and they are fast superseding all other inventions for **ROCK DRILLING.** They are constructed of various sizes and patterns to suit different classes of work, being adapted to Channelling and Gadding in quarries; to shafting, tunneling, prospecting and all open cut work in mines; also to heavy Railroad-grading and Sub-marine Blasting. They operate noiselessly without percussion: and produce a perfectly cylindrical hole of uniform diameter. Their usual rate of boring is three to five (3 to 5) inches per minute in hard rock; eight to ten (8 to 10) inches per minute in slate and sand rock, and eighteen to twenty-two (18 to 22) inches per minute in coal TEST CORES, in the form of solid cylinders of rock or mineral may be taken out of mines from any depth—not exceeding one thousand (1,000) feet—showing the geological formation, character of mineral deposits, &c. These drills never need sharpening and no steel is consumed in boring—as the cutting points (*composed of rough, uncut diamonds,*) are practically indestructible. Boilers, Engines, Steam Pumps, and all necessary tools furnished with drills. Illustrated circular sent on application.

SEVERANCE & HOLT, Man'f's,

Office, 16 Wall Street, NEW YORK.

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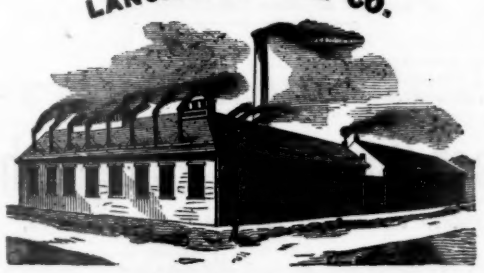

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LANCASTER, PA.

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[*Successor to Wm. Hancock, Rough and Ready Iron Works,*]

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MANUFACTURER OF

RAILROAD IRON,

RAILROAD CHAIRS, SPLICE BARS AND BOLTS, FROGS, SWITCH RODS, STANDS AND LEVERS, HOOKHEAD AND COUNTERSUNK HEAD SPIKES, BRIDGE AND CAR BOLTS, ROLLS AND ROLLING MILL MACHINERY, BLAST FURNACE CASTINGS AND MACHINERY, STEAM ENGINES AND BOILERS, IRON AND BRASS CASTINGS, ENGINE AND MACHINE WORK, STEAM & WATER FITTINGS, &c., &c.

WM. HANCOCK, President.

BENJ. J. WELCH, Sec., Treas. and Gen. Manager, Danville, Pa. | **P. C. BRINCK, Vice-President, 401 Walnut St., Philadelphia.**

THE

"RED LINE!"

—RUNNING OVER THE—

Michigan Southern and Lake Shore R. R.'s,

—WAS THE—

FIRST LINE to CARRY FREIGHT BETWEEN the EAST and WEST,

WITHOUT CHANGE OF CARS!

CARS RUN THROUGH TO

NEW YORK AND BOSTON,

IN FOUR AND FIVE DAYS!

☞ Contracts made at the Offices of the Line. ☜

C. Shutter, Agent, 347 Broadway, New York. **A. Cushman, Agent,** Old State House, Boston, Mass.

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Great Central Route.

"BLUE LINE."

ORGANIZED JANUARY 1, 1867.

1870.

1870.

OWNED AND OPERATED BY THE

Michigan Central, Illinois Central, Chicago, Burlington & Quincy, Chicago & Alton, Great Western (of Canada), New York Central, Hudson River, Boston & Albany, and Providence and Worcester Railroads.

THE **"BLUE LINE"** is the only route that offers to shippers of freight the advantages of an unbroken gauge through from Chicago to the Seaboard, and to all Interior Points on the line of Eastern Connections beyond Suspension Bridge and Buffalo. All Through Freight is then transported between the most distant points of the roads in interest,

WITHOUT CHANGE OF CARS!

The immense freight equipment of all the roads in interest is employed, as occasion requires, for the through service of this Line, and has of late been largely increased. This Line is now prepared to extend facilities for the transit and delivery of all kinds of freight in Quicker Time and in Better Order than ever before.

The Blue Line Cars

are all of a solid, uniform build, thus largely lessening the chances of delay from the use of cars of a mixed construction, and the consequent difficulty of repairs, while remote from their own roads. The Blue Line is operated by the railroad companies who own it, without the intervention of intermediate parties between the Roads or Line and the public.

Trains run through with regularity **IN FOUR OR FIVE DAYS** to and from New York and Boston. Especial care given to the Safe and Quick Transport of Property Liable to Breakage or Injury, and to all **Perishable Freight.**

Claims for overcharges, loss or damage, promptly settled upon their merits. Be particular and direct all shipments to be marked and consigned via

"BLUE LINE."

☞ *FREIGHT CONTRACTS* given at the offices of the company in Chicago, New York and Boston.

J. D. HAYES, GEN. MANAGER,..Detroit. | P. K. RANDALL,..No. 11 State St., Boston
C. E. NOBLE,....No. 8 Astor House, N. Y. | F. A. HOWE,....31 Dearborn St., Chicago
N. D. MUNSON,.....Quincy, Ill. | W. W. STREET,..31 Dearborn St., Chicago
GEO. E. JARVIS,.....273 Broadway, N. Y. | J. JOHNSON,.....Cairo, Ill

THOS. HOOPS, GEN. FR'T AGT. Michigan Central Railroad, Chicago.
A. WALLINGFORD, AGT. GRT. WEST'N R. R., No. 91 Lake St., Chicago.
N. A. SKINNER, Freight Agent Michigan Central Railroad.

Empire Line!

THE EMPIRE TRANSPORTATION COMPANY'S

Fast Freight Line to the East

—AND—

TO THE COAL AND OIL REGIONS,

Via Michigan Southern, Lake Shore, and Philadelphia & Erie R. R.'s,

WITHOUT TRANSFER!

Office, No. 72 LaSalle Street, Chicago.

GEO. W. RISTINE, Western Superintendent, Cleveland, Ohio.

W. G. Van Demark,..265 Broadway, New York. | **E. L. O'Donnell,**.....Baltimore, Md
G. B. McCulloh,....42 South 5th St., Philadelphia. | **Wm. F. Smith,**.....Erie, Penn.

JOHN WHITTAKER, Pier 14 North River, New York.

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W. T. HANCOCK, Contracting Agent.
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CHICAGO, ROCK ISLAND & PACIFIC RAILROAD.

☞ THE DIRECT ROUTE FOR ☜

Joliet, Morris, Ottawa, La Salle, Peru, Henry, Lacon, Peoria, Geneseo, Moline, Rock Island,

DAVENPORT, MUSCATINE, WASHINGTON, IOWA CITY,

Grinnell, Newton, Des Moines,

COUNCIL BLUFFS & OMAHA

CONNECTING WITH TRAINS ON THE UNION PACIFIC RAILROAD, FOR

CHEYENNE, DENVER, CENTRAL CITY, OGDEN, SALT LAKE, WHITE PINE, HELENA, SACRAMENTO, SAN FRANCISCO,

And Points in Upper and Lower California; and with Ocean Steamers at San Francisco, for all Points in **China, Japan, Sandwich Islands, Oregon and Alaska.**

☞ TRAINS LEAVE their Splendid new Depot, on VanBuren Street, Chicago, as follows:

	LEAVE.	ARRIVE.
PACIFIC EXPRESS, (Sunday excepted)	10.00 a. m.	3.35 p. m
PERU ACCOMMODATION, (Sundays excepted)	5.00 p. m.	9.50 a. m
PACIFIC EXPRESS, (Saturdays excepted,)	10.00 p. m.	[Mon. ex. 6.00 a. m

Elegant Palace Sleeping Cars run Through to Peoria & Council Bluffs WITHOUT CHANGE!

TICKETS TO ST. LOUIS!

FIRST CLASS, including Meals and Berths on Steamer bet. Peoria and St. Louis, - **$8.00**
SECOND CLASS, - - - - - - - - - - - - - - - **$5.50**

AN ELEGANT PASSENGER STEAMER

Leaves Peoria every morning for St. Louis, upon arrival of Night Express, leaving Chicago daily (Saturday excepted) at **11 00 P. M.,** from Great Rock Island Depot, head of LaSalle St., arriving in St. Louis the following morning, connecting with morning trains leaving the city, and with steamers down the River.

Families Emigrating to Missouri or Kansas, will find this the most desirable and cheapest Route, as through Freight Rates for household goods are much lower than all rail routes.

☞ Connections at LA SALLE, with Illinois Central Railroad, North and South; at PEORIA, with Peoria, Pekin & Jacksonville Railroad, for Pekin, Virginia, &c.; at PORT BYRON JUNCTION, for Hampton, LeClaire, and Port Byron; at ROCK ISLAND, with Packets North and South on the Mississippi River.

☞ **For Through Tickets,** and all desired information in regard to Rates, Routes, etc., call at the Company's Office, No. **37** South Clark Street Chicago.

A. M. SMITH, Gen. Pass. Agent. HUGH RIDDLE, Gen. Supt. P. A. HALL, Asst. Gen. Supt.

LEAVENWORTH, LAWRENCE — AND — GALVESTON R. R. OF KANSAS.

☞ **The SHORTEST and ONLY DIRECT ROUTE to the celebrated Neosho and Verdigris Valleys of Kansas, and will be opened for business to the Border of Indian Territory, by October 1st, 1870.**

☞ *TWO DAILY PASSENGER TRAINS EACH WAY,* connecting at LAWRENCE with KANSAS PACIFIC TRAINS for all parts of the EAST, WEST and NORTH, and at end of Track with KANSAS STAGE COMPANY'S Line of Coaches for all parts of

INDIAN TERRITORY, TEXAS & NEW MEXICO.

☞ **Ask for Tickets via L. L. & G. R. R.,** for all points South of Kansas Pacific Railroad. Freight taken from any part of the East to end of track WITHOUT BREAKING BULK.

CHAS. B. PECK,
Gen. Freight and Ticket Agent, Lawrence, Kan.

M. R. BALDWIN,
Acting Superintendent, Lawrence, Kan.

CHAS. J. PUSEY, **P. O. Address—Box 5222.** EDW'D H. PARDEE.

Pusey & Pardee,

74 BROADWAY, NEW YORK.

American and English Rails,

LOCOMOTIVES AND CARS FISH-PLATES, SPIKES, &c.

—SOLE AGENTS FOR—

Atkins Brothers' Pottsville Rolling Mills, and G. Buchanan & Co., of London.

☞ Special attention given to filling orders for small T and **STREET RAILS,** of every weight and pattern.

OLD RAILS BOUGHT OR RE-ROLLED, AS DESIRED.

J. E. FRENCH. W. S. DODGE. D. W. CROSS.

Winslow Car Roofing Company.

PATENT IRON CAR ROOFS.

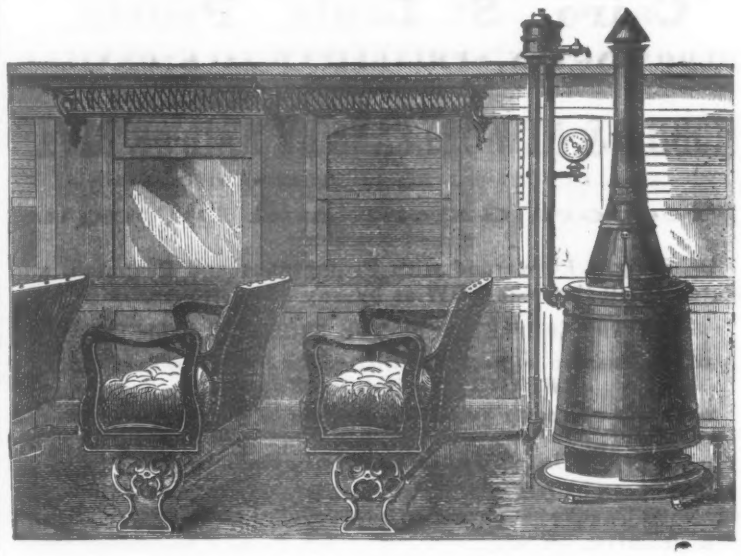
Established, 1859.

No. 211 Superior St. CLEVELAND, O.

Over 20,000 Cars covered with this Roof! We claim that these Roofs will keep Cars dry, and will last as long as the Cars they cover without any extra expense after once put on.

☞ SEND FOR CIRCULARS.

WARMING AND VENTILATING Railroad Cars BY HOT WATER.



BAKER'S PATENT CAR WARMER.—One way of Applying it.

A very simple, safe and efficient plan for

Warming Railway Carriages!

—BY—

HOT WATER PIPES,

WHICH RADIATES THE HEAT DIRECTLY AT THE FEET OF EACH PASSENGER WITHOUT THE NECESSITY OF GOING TO THE STOVE TO GET WARMED!

☞ All the finest Drawing-Room and Sleeping Cars in the United States have it, or are adopting it. Full descriptive pamphlets furnished on application.

Baker, Smith & Co.,

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Car & Wheel Works,

MANUFACTURERS OF

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AND ALL DESCRIPTIONS OF

Engine, Car, and Bridge Castings, of any Pattern.

Wheels of all sizes constantly on Hand.

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OFFICES: No. 80 Broadway, New York; No. 69 West 3d Street, Cincinnati, Ohio.
WORKS: Cor. Lewis and East Front Streets, Cincinnati, Ohio.

American Compound Telegraph Wire.

More than 3000 Miles now in Operation,

Demonstrating beyond question its superior working capacity, and great ability to withstand the elements. For RAILROAD LINES, connecting a single wire with a large number of Stations, and for long circuits, this wire is peculiarly adapted; the large conducting capacity secured by the copper, with other advantages, rendering such lines fully serviceable during the heaviest rains.

Having a core of steel, a small number of poles only are required, as compared with iron wire construction, thereby preventing much loss of the current from escape and very materially reducing cost of maintenance. OFFICE AMERICAN COMPOUND TELEGRAPH WIRE CO.
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BLISS, TILLOTSON & CO., Western Agents,
247 South Water Street, Chicago.

MANSFIELD ELASTIC FROG COMPANY

OF CHICAGO.

AMOS T. HALL, President. | J. H. DOW, Superintendent.

Are now prepared to receive and promptly execute orders for RAILROAD FROGS and CROSSINGS warranted to prove satisfactory to purchasers

For DURABILITY, SAFETY and ELASTICITY—being a combination of Steel, Boiler Plate and Wood—they are UNEQUALED, as Certificates of Prominent Railroad Officials will testify.

The SAVING TO ROLLING STOCK AND MOTIVE POWER is at least equal to double the cost of the FROG. Orders should be addressed to

CRERAR, ADAMS & CO., Gen'l Agents,
No. 18 Wells Street, CHICAGO.

CHICAGO & NORTHWESTERN R. W.

Comprising the PRINCIPAL RAILROADS from CHICAGO Directly NORTH NORTH-WEST and WEST.

ALL RAIL TO THE PACIFIC OCEAN!

Great California Line.

TRAINS LEAVE WELLS STREET DEPOT AS FOLLOWS:

8:15 A. M. Cedar Rapids Pass	**9:15 P. M. Night Mail.**
10:30 A. M. Pacific Express.	**9:15 P. M. Rock Island Pass.**
10:30 A. M. Rock Island Exp.	**4:00 P. M. Dixon Passenger.**

For Sterling, Rock Island, Fulton, Clinton, Cedar Rapids, Boone, Denison, Missouri Valley Junction, Sioux City, Council Bluffs and Omaha, there connecting with the

UNION PACIFIC R. R.

For Cheyenne, Denver, Ogden, Salt Lake, the White Pine Silver Mines, Sacramento, San Francisco, and all parts of Nebraska, Colorado, New Mexico, Arizona, Wyoming, Montana, Idaho, Utah, Nevada, and the PACIFIC COAST.

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
To OMAHA,.....	23	$20.00	To SACRAMENTO,.	4½	$118.00
" DENVER,.....	52	70.75	" SAN FRANCISCO,	5	118.00

TRAINS ARRIVE:—Night Mail, 7.00 a. m.; Dixon Passenger, 11:10 a. m.; Pacific Express, 3:50 p. m.; Rock Island Express, 3:50 p. m.; Cedar Rapids Passenger, 6:50 p. m.

FREEPORT LINE.

9.00 A. M. & 9.45 P. M. For Belvidere, Rockford, Freeport, Galena, Dunleith, and St. Paul.

4.00 P. M., Rockford Accommodation.
5.30 P. M., Geneva and Elgin Accommodation
6.10 P. M., Lombard Accommodation.
5:50 P. M., Junction Passenger.

TRAINS ARRIVE:—Freeport Passenger, 2:30 a. m., 3:00 p. m.; Rockford Accommodation, 11:10 a. m.; Geneva and Elgin Accommodation, 8:45 a. m.; Junction Passenger, 8:10 a. m.; Lombard Accommodation, 6:50 a. m.

WISCONSIN DIVISION.

☞ Trains leave Depot, cor. West Water and Kinzie Sts., daily, Sundays excepted, as follows:

10.00 A. M. DAY EXPRESS, for Janesville, Monroe, Whitewater, Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER; Ripon, Berlin, Fond du Lac, Oshkosh, Neenah, Appleton, and Green Bay.

3.00 P. M., Janesville Accommodation.

5.00 P. M. NIGHT EXPRESS, for Madison, Prairie du Chien, Watertown, Minnesota Junction, Portage City, Sparta, La Crosse, St. Paul, and ALL POINTS ON THE UPPER MISSISSIPPI RIVER: Ripon, Berlin, Fond du Lac, Oshkosh, Menasha, Appleton, Green Bay, and THE LAKE SUPERIOR COUNTRY.

5.30 P. M., Woodstock Accommodation.
6:20 P. M., Barrington Passenger.

TRAINS ARRIVE:—5:30 a. m., 7:45 a. m., 10:10 a. m., 1:00 p. m. and 7:15 p. m.

MILWAUKEE DIVISION.

MILWAUKEE MAIL.....	8:00 A. M.
EXPRESS, (ex. Sun.) Waukegan, Kenosha, Racine and Milwaukee,....10:00 A. M.	5:00 P. M.
EVANSTON PASSENGER,.....	11:40 A. M.
HIGHLAND PARK PASSENGER,.....	1:30 P. M.
MILWAUKEE ACCOMMODATION, with Sleeping Car attached.....	11:00 P. M.
EVANSTON ACCOMMODATION, (Daily,) from Wisconsin Div. Depot.....	1:30 P. M.
KENOSHA ACCOMMODATION, (Sundays excepted) from Wells St. Depot.....	4:15 P. M.
AFTERNOON PASSENGER, from Milwaukee Div. Depot.....	5:00 P. M.
WAUKEGAN ACCOMMODATION, (except Sundays) from Wells St. Depot.....	5:25 P. M.
WAUKEGAN PASSENGER, (Sundays excepted) from Wells St. Depot.....	6:15 P. M.

TRAINS ARRIVE:—Night Accommodation, with Sleeping Car, 5:00 a. m.; Day Express, 4:30 p. m. Milwaukee Mail, 10:15 a. m.; Afternoon Passenger, 8:00 p. m.; Waukegan Accommodation, 8:2 ; a. m.; Kenosha Accommodation, 9:10 a.m.; Evanston Accommodations, 1.50 and 4.00 p. m.; Waukegan Passenger, 7:55 a. m.; Highland Park Passenger, 4.00 p. m.

PULLMAN PALACE CARS ON ALL NIGHT TRAINS.

THROUGH TICKETS Can be purchased at all principal Railroad Offices East and South, and in Chicago at the Southeast corner of Lake and Clark Streets, and at the Passenger Stations as above.

H. P. STANWOOD, Gen. Ticket Agt.
GEO. L. DUNLAP, Gen'l Supt.

Western Union Railroad.

CHICAGO & NORTHWESTERN DEPOT, CHICAGO. | MILWAUKEE & CHICAGO DEPOT, MILWAUKEE.

THE DIRECT ROUTE!

CHICAGO, RACINE & MILWAUKEE,

— TO —

Beloit, Savanna, Clinton, Pt. Byron, Davenport, Mineral Point, Madison, Freeport, Fulton, Lyons, Rock Island, Sabula, Galena, Dubuque, Des Moines, Council Bluffs,

OMAHA, SAN FRANCISCO

AND ALL PRINCIPAL POINTS IN

Southern and Central Wisconsin, Northern Illinois, and Central and Northern Iowa.

FRED. WILD, Gen. Ticket Agent.
D. A. OLIN, Gen. Superintendent.

CRERAR, ADAMS & CO.,

MANUFACTURERS AND DEALERS IN

Railroad Supplies!

—AND—

CONTRACTORS' MATERIAL.

11 and 13 Wells Street,

CHICAGO, ILL.

Manufacturers of IMPROVED HEAD-LIGHTS for Locomotives, Hand and Signal Lanterns, Car and Station Lamps, Brass Dome Casings, Dome Mouldings, Cylinder Heads, and Car Trimmings, of Every Description.

Pan-Handle

— AND —

Penn'a Central Route East!

☞ SHORTEST AND QUICKEST ROUTE, VIA COLUMBUS, TO

PITTSBURGH, BALTIMORE, PHILADELPHIA & NEW YORK

On and after Saturday, JANUARY 1st, 1870, Trains for the East will run as follows:

[DEPOT CORNER CANAL AND KINZIE STS., WEST SIDE.]

6:45 A. M. NEW YORK EXPRESS.

[SUNDAYS EXCEPTED.] Arriving at

COLUMBUS.....8:55 P. M.	HARRISBURG...2.30 P. M.	NEW YORK....10:26 P. M.	WASHINGTON
PITTSBURGH....4:47 A. M.	PHILADELPHIA 7:00 P. M.	BALTIMORE... 7:00 P. M.	CITY.....10:00 P. M.

7:45 P. M. NIGHT EXPRESS.

[SATURDAYS EXCEPTED.] Arriving at:

COLUMBUS.. .11:10 A. M.	HARRISBURG., 5:20 A. M	NEW YORK....12:05 P. M.	WASHINGTON. 1:00 P. M.
PITTSBURGH.. 7:05 P. M.	PHILADELPHIA.9.40 A. M.	BALTIMORE... 9:00 A. M.	BOSTON.....11:30 P. M.

Woodruff's Palace Day and Sleeping Cars

Run Through to COLUMBUS, and from Columbus to NEW YORK, WITHOUT CHANGE!

ONLY ONE CHANGE TO NEW YORK, PHILADELPHIA, OR BALTIMORE!

TRY THE NEW ROUTE. FARE AS LOW AS BY OTHER LINES.

CINCINNATI & LOUISVILLE AIR LINE SOUTH.

42 Miles the Shortest Route to Cincinnati,
18 Miles the Shortest Route to Indianapolis and Louisville.

—FROM ONE TO—

2 Hours the Quickest Route to Cincinnati!

THE SHORTEST AND BEST ROUTE TO

Columbus, Chillicothe, Hamilton, Wheeling, Parkersburg, Evansville, Dayton, Zanesville, Marietta, Lexington, Terre Haute, Nashville,

ALL POINTS IN CENTRAL & SOUTHERN OHIO, & INDIANA, KENTUCKY & VIRGINIA.

— QUICK, DIRECT AND ONLY ALL RAIL ROUTE TO —

New Orleans, Memphis, Mobile, Vicksburg, Charleston, Savannah,

AND ALL POINTS SOUTH.

Cincinnati, Indianapolis and Louisville Trains run as follows:

THROUGH WITHOUT CHANGE OF CARS!

6:45 A. M. (Sundays excepted) Arriving at		**7:45 P. M.** (Saturdays excepted.) Arriving at	
LOGANSPORT	12:10 P. M.	LOGANSPORT	1:30 A. M.
KOKOMO	1:40 P. M.	KOKOMO	2:49 A. M.
CINCINNATI	9:40 P. M.	CINCINNATI	10:00 A. M.
INDIANAPOLIS	4:30 P. M.	INDIANAPOLIS	6:00 A. M.
LOUISVILLE	11:30 A. M.	LOUISVILLE	8:30 P. M.

Lansing Accommodation: Leaves 3:45 P. M. Arrives 9:15 A. M.

PULLMAN'S PALACE SLEEPING CARS!

Accompany all Night Trains between Chicago and Cincinnati or Indianapolis.

☞ Ask for Tickets via **COLUMBUS** for the East, via **HAGERSTOWN** for Cincinnati, and via **KOKOMO** for Indianapolis, Louisville and points South. Tickets for sale and Sleeping Car Berths secured at 95 **RANDOLPH STREET, CHICAGO,** and at Principa Ticket Offices in the West and Northwest.

WM. L. O'BRIEN, Gen. Pass. and Ticket Agent, Columbus.
I. S. HODSDON, Northwestern Pass. Agt., Chicago.

KANSAS PACIFIC RAILWAY.

Great Smoky Hill Route!

— TO —

COLORADO, NEW MEXICO, ARIZONA, UTAH,

Montana, Nevada, California and Northern States of Old Mexico.

COMPLETED THROUGH KANSAS, TO

Carson, Colorado, 487 Miles West of Kansas City and Leavenworth.

Close Connections are made with Express Trains of the HANNIBAL & ST. JOSEPH and NORTH MISSOURI RAILROADS, at KANSAS CITY, and with MISSOURI PACIFIC RAILROAD at STATE LINE.

DAILY EXPRESS TRAINS are run between

KANSAS CITY, LEAVENWORTH, LAWRENCE,

Topeka, Wamego, Manhattan, Junction City, Salina, Brookville,

HARKER, HAYS and CARLTON.

Pullman's Sleeping Cars Attached to Night Express Trains!

Passenger Time from Kansas City to Denver, Less than 50 Hours.

Hughes & Co.'s Four-Horse Concord Coaches leave Carson daily for Denver, Central City, Georgetown, &c.

Southern Overland Passenger Express and Mail Coaches leave Carson daily for Fort Lyon, Pueblo, Trinidad, Fort Union, Las Vegas, Santa Fe, &c.

Ask for Through Tickets via Kansas Pacific Railway, "Smoky Hill Route." Freight and Passage Rates as Low and Time as Quick as by any other Route.

R. B. GEMMELL, Gen. Ticket Agent.
A. ANDERSON, Gen. Supt.

THE FAVORITE THROUGH PASSENGER ROUTE!

Chicago, Burlington & Quincy

RAILROAD, AND CONNECTIONS.

3 THROUGH EXPRESS TRAINS DAILY.

FROM CHICAGO	Hours.	1st Class Fare.	FROM CHICAGO	Days.	1st Class Fare.
To OMAHA, - -	23	$20.00	To DENVER, - -	2¼	$70.??
" ST. JOSEPH, -	21	19.50	" SACRAMENTO,	4½	118.00
" KANSAS CITY, -	22	20.00	" SAN FRANCISCO,	5	118.00

TRAINS LEAVE CHICAGO from the Great Central Depot, foot of Lake Street, as follows:

BURLINGTON, KEOKUK, COUNCIL BLUFFS AND OMAHA.

7:40 A. M. **MAIL AND EXPRESS,** (Daily except Sunday,) stopping at all stations between Chicago and Burlington; making close connections at Mendota with Illinois Central for Amboy, Dixon, Freeport, Galena, Dunleith, Dubuque, LaSalle, El Paso, Bloomington, &c., &c.

10:45 A. M. **PACIFIC EXPRESS,** (Daily except Sunday,) stopping only at Riverside, Hinsdale, Aurora, Leland, Mendota, Princeton, Rock Island Crossing, Buda, Kewanee, Galva, Galesburg, and Monmouth, between Chicago and Burlington. **PULLMAN PALACE DRAWING ROOM CAR** attached to this train daily from Chicago

TO COUNCIL BLUFFS AND OMAHA, WITHOUT CHANGE!

11:30 P. M. **NIGHT EXPRESS,** (Daily, except Saturday,) stopping at all principal stations between Chicago and Burlington. ELEGANT DAY COACHES, and a **PULLMAN PALACE SLEEPING CAR** are attached to this train from **Chicago to Burlington, without change!** This is the only Route between

CHICAGO, COUNCIL BLUFFS & OMAHA,

— RUNNING THE CELEBRATED —

Pullman Palace Dining Cars!

The Shortest, Best, Quickest and only Route between

CHICAGO & KEOKUK,

Without Ferrying the Mississippi River!

QUINCY, ST. JOSEPH, LEAVENWORTH AND KANSAS CITY.

10:45 A. M. **PACIFIC EXPRESS,** (Daily, except Sunday,) with PALACE COACH attached, running through from Chicago to KANSAS CITY, **Without Change!**

5:00 P. M. **EVENING EXPRESS,** (Daily, except Sunday,) with **Pullman Palace Drawing Room Sleeping Car** attached, running through from Chicago to QUINCY, WITHOUT CHANGE!

11:30 P. M. **NIGHT EXPRESS** (Daily, except Saturday,) with **Pullman Palace Sleeping Car** attached from Chicago to GALESBURG; PALACE DAY COACHES from Chicago to QUINCY, **Without Change!**

☞ This is the Shortest, Quickest and only Route between ☜

CHICAGO AND KANSAS CITY,

WITHOUT CHANGE OF CARS OR FERRY.

THE SHORTEST, BEST AND QUICKEST ROUTE BETWEEN CHICAGO AND

St. Joseph, Atchison, Weston, Leavenworth,

AND ALL POINTS ON THE KANSAS PACIFIC R'Y.

Local Trains Leave { RIVERSIDE & HINSDALE ACCOMMODATION.7:00 A. M. 1:30 & 6:15 P. M. / MENDOTA PASSENGER.....4:15 P. M. / AURORA PASSENGER.....5:30 P. M.

Trains Arrive:—Mail and Express, 3:45 p. m; Atlantic Exp., 4:15 p. m, except Sunday; Night Exp, 9:40 a. m., except Monday; Mendota Passenger, 10:10 a. m.; Aurora Passenger, 8:15 a. m.; Quincy Passenger 7:30 P. M.; Riverside and Hinsdale Accommodation, 6:50 and 9 a. m and 5:30 p. m., except Sunday.

Ask for Tickets via Chicago, Burlington & Quincy Railroad, which can be obtained at all principal offices of connecting roads, and at Company's office in Great Central Depot, Chicago, at as low rates as by any other route.

ROB'T HARRIS, Gen'l Superintendent, CHICAGO.
SAM'L POWELL, Gen'l Ticket Agent, CHICAGO.
E. A. PARKER, Gen. West. Pass. Agt., CHICAGO.

☞ **PASSENGERS GOING WEST!** ☜

To Missouri, Kansas, Nebraska, Colorado or New Mexico, Should Buy Tickets via the Short Route

HANNIBAL & ST. JOSEPH R. R. LINE.

Three Express Trains from Quincy or Macon to St. Joseph.

—ALSO DIRECT—

To Kansas City

☞ WITHOUT CHANGE OF CARS! ☜

CONNECTIONS ARE CLOSE AND DIRECT FOR

ATCHISON, WESTON & LEAVENWORTH.

CONNECTIONS:

AT KANSAS CITY, with Kansas Pacific Railway, for Lawrence, Ottawa, Topeka, Fort Riley Junction City, Fort Hays, Sheridan, &c.
AT KANSAS CITY, with Kansas City, Fort Scott, and Galveston Railroad, for Fort Scott, Fort Gibson, Galveston, &c.
AT ST. JOSEPH, with St. Joseph & Council Bluffs Railroad, ALL RAIL from St. Joseph to

Nebraska City, Council Bluffs & Omaha.

AT OMAHA, with Nebraska Union Pacific Railroad, for Fort Kearney, Julesburg, Cheyenne, Laramie, Benton, &c.
AT COUNCIL BLUFFS, for Sioux City, all Rail.

☞ By this Line, passengers have choice of Overland Routes, either via Smoky Hill or Platte Route To Denver, Central City, Salt Lake, Sacramento, California and all points in the Mining Regions.

Daily Overland Coaches via Smoky Hill Route leave Sheridan, end of U. P. R. R., for Santa Fe and New Mexico

Through Tickets for Sale at all Ticket Offices.

P. B. GROAT, Gen. Ticket Agent. **GEO. H. NETTLETON, Gen. Supt.**
HENRY STARRING, Gen. Agent, Chicago.

Old, Reliable, Air-Line Route!

CHICAGO, ALTON & ST. LOUIS R. R.

SHORTEST, QUICKEST AND ONLY DIRECT ROAD TO

Bloomington, Springfield, Jacksonville, Alton,

— AND —

ST. LOUIS!

WITHOUT CHANGE OF CARS.

THE ONLY ROAD MAKING IMMEDIATE CONNECTIONS AT ST. LOUIS, WITH MORNING AND EVENING TRAINS

—FOR—

ATCHISON, LEAVENWORTH, KANSAS CITY,

Lawrence, Topeka, Memphis, New Orleans,

And All Points South and Southwest.

☞ TRAINS leave CHICAGO from the West-side Union Depot, near Madison Street Bridge. ☜

EXPRESS MAIL, [Except Sundays]	**8:10 A. M.**
LIGHTNING EXPRESS, [Except Saturdays and Sundays]	**9:50 P. M.**
NIGHT EXPRESS, [Except Saturdays]	**6:00 P. M.**
JOLIET ACCOMMODATION, [Except Sundays]	**4:40 P. M.**
JACKSONVILLE EXPRESS, [Daily]	**6:00 P. M.**

Trains arrive at Chicago at **8.00 P. M., 8.30 A. M.** and **6:00 A. M.** Joliet Accom., **9.40 A. M.**

This is the ONLY LINE Between CHICAGO & ST. LOUIS RUNNING

Pullman's Palace Sleeping and Celebrated Dining Cars!

BAGGAGE CHECKED THROUGH.

Through Tickets can be had at the Company's office, No. 55 Dearborn street, Chicago, or at the Depot, corner of West Madison and Canal streets, and at all principal Ticket Offices in the United States and Canada. Rates of Fare and Freights as low as by any other Route.

A. NEWMAN, Gen. Pass. Agent. **J. C. McMULLIN, Gen. Supt.**

North Missouri R. R.

PASSENGERS FOR

KANSAS AND THE WEST,

ARE REMINDED THAT

THE NORTH MISSOURI R. R.

— IS —

11 MILES SHORTER than any other Route!

BETWEEN

St. Louis and Kansas City.

15 Miles Shorter between ST. LOUIS and LEAVENWORTH

— AND —

49 MILES SHORTER TO ST. JOSEPH!

THAN ANY OTHER LINE OUT OF ST. LOUIS.

☞ **Three Through Express Trains Daily!** ☜

Pullman's Celebrated Palace Sleeping Cars on all Night Trains!

☞ **FOR TICKETS,** apply at all Railroad Ticket Offices, and see that you get your Tickets via St. Louis and North Missouri Railroad.

C. N. PRATT, Gen. East'n Agt., 111 Dearborn st. CHICAGO.
J. M. DAVIES, General Passenger Agent, ST. LOUIS.
S. H. KNIGHT, General Superintendent, ST. LOUIS.

Pacific Railroad of Missouri.

THE MOST DIRECT AND RELIABLE ROUTE FROM ST. LOUIS THROUGH TO

KANSAS CITY, LEAVENWORTH & ATCHISON,

☞ WITHOUT CHANGE OF CARS! ☜

Close Connections at KANSAS CITY with Missouri Valley, Missouri River, Ft. Scott & Gulf, and Kansas Pacific R'ys, for Weston, St. Joseph, Junction City, Fort Scott, Lawrence, Topeka, Sheridan, Denver, Fort Union, Santa Fe, and

ALL POINTS WEST!

☞ At SEDALIA, WARRENSBURG and PLEASANT HILL, with Stage Lines for Warsaw, Quincy, Bolivar, Springfield, Clinton, Osceola, Lamar, Carthage, Granby, Neosho, Baxter Springs, Fort Gibson, Fort Smith, Van Buren, Fayetteville, Bentonville.

PALACE SLEEPING CARS on all NIGHT TRAINS.

Baggage Checked Through Free!

THROUGH TICKETS for sale at all the Principal Railroad Offices in the United States and Canadas. **Be Sure and Get your Tickets over the PACIFIC R. R. OF MISSOURI.**

W. B. HALE, Gen. Pass. and Ticket Agt.
THOS. McKISSOCK, General Superintendent.

Sixty-One Miles the Shortest Line! Only Thirty Hours!

— FROM —

CHICAGO TO NEW YORK.

Pittsburgh, Ft. Wayne & Chicago and Pennsylvania Central

IS THE ONLY ROUTE RUNNING ITS ENTIRE TRAIN THROUGH TO PHILADELPHIA AND NEW YORK, AND THE ONLY ROUTE RUNNING

THREE DAILY LINES OF PULLMAN'S DAY AND SLEEPING PALACES,

— FROM CHICAGO TO —

PITTSBURGH, HARRISBURG, PHILADELPHIA & NEW YORK,

☞ WITHOUT CHANGE! ☜

WITH BUT ONE CHANGE TO

BALTIMORE, PROVIDENCE, NEW HAVEN,

HARTFORD, SPRINGFIELD, WORCESTER AND BOSTON

And the Most Direct Route to Washington City.

☞ Trains Leave WEST SIDE UNION DEPOT, corner West Madison and Canal Streets, as follows:

LEAVE:	Mail	Fast Express.	Pacific Exp.	Night Exp.	VALPARAISO ACCOMMODATION, Leaves CHICAGO daily, (except Sunday,) at 4.50 P. M.
CHICAGO	6.40 A. M.	11.00 A. M.	5.15 P. M.	9.00 P. M.	
PLYMOUTH	10.46 "	2 00 P. M.	s. 9 10 "	2.13 A. M.	
FORT WAYNE	2.00 P. M.	3.55 "	11.30 "	B. 5.30 "	
LIMA	4.24 "	5.30 "	1.35 A. M.	8.10 "	
FOREST	5.40 "	6.28 "	2 48 "	9 40 "	
CRESTLINE	6.00 A. M.	s. 8.00 "	4.30 "	D. 12.05 P. M.	
MANSFIELD	6.42 "	8 25 "	5.00 "	12.34 "	
ORRVILLE	9.05 "	10.00 "	6.45 "	2.27 "	
ALLIANCE	11 15 "	11.20 "	B. 8.40 "	3.55 "	
ROCHESTER	D. 2 05 P. M.	1.15 A. M.	10.52 "	6.02 "	South'n Exp.
PITTSBURGH	4 00 "	2.50 "	12.45 P. M.	s. 7.50 "	5.30 A. M.
BLAIRSVILLE BRANCH	6.05 "	4.34 "	2.49 "	9.54 "	7.23 "
JOHNSTOWN	6.56 "	5.18 "	3.37 "	10.42 "	8.08 "
CRESSON	7.58 "	6.04 "	4.38 "	11.43 "	9.04 "
ALTOONA	s. 9.05 "	B. 7.00 "	s. 5.45 "	12.35 A. M.	B. 10.05 "
HUNTINGDON	10.31 "	8.06 "	7.04 "	1.45 "	11.14 "
LEWISTOWN	11.44 "	9.10 "	8.23 "	2.59 "	12.25 P. M.
HARRISBURG	2.10 A. M.	11.12 "	10.45 "	5.30 "	D. 2.50 "
LANCASTER	3.40 "	12.37 P. M.	12.15 A. M.	7.00 "	4.10 "
DOWNINGTON	5.00 "	1.37 "	1.40 "	B. 8.16 "	5.35 "
ARRIVE:					
PHILADELPHIA	6.30 "	2.45 "	3.10 "	9.40 "	7.00 "
NEW YORK, VIA PHILADELPHIA	10.41 "	6.00 "	6.43 "	1.00 P. M.	10.26 "
NEW YORK, VIA ALLENTOWN	.....	6.00 "	.....	12.05 P. M.	.....
BALTIMORE	.....	2.45 "	4.20 "	9.00 A. M.	7.00 "
WASHINGTON	.....	6.20 "	5.50 "	1.00 P. M.	10.00 "
BOSTON	9.00 P. M.	5.50 A. M.	5.05 P. M.	11.50 "	.....

THE FAST EXPRESS Leaves Chicago daily, except Sunday; the entire Train,—Baggage, Day and Palace Cars—RUNNING THROUGH from Chicago to New York, via Manua Junction; leaves Pittsburgh daily, except Sunday; has SLEEPING CAR from Crestline to Altoona, except Saturday. This train **reaches NEW YORK one hour in advance of all other Lines, and in time to make close connection for BOSTON!** No other Route through New York makes it! Arrives in BALTIMORE **Five Hours,** and WASHINGTON **Four Hours in Advance of Rival Routes!**

THE PACIFIC EXPRESS Leaves Chicago and Pittsburgh daily, for Philadelphia and New York, with PULLMAN PALACE CARS from Chicago; leaves Harrisburg for Baltimore daily, except Sunday; has SLEEPING CARS from Chicago to Pittsburgh, and from Altoona to Philadelphia. This train arrives in BALTIMORE **Nine Hours,** and WASHINGTON **Seven Hours, in Advance of all other Lines!**

THE NIGHT EXPRESS Leaves Chicago daily, except Saturday and Sunday; leaves Pittsburgh daily, except Sunday; leaves Harrisburg for Baltimore daily; has SILVER PALACE CARS on Tuesday, Wednesday and Friday; COMPARTMENT CAR on Monday and Thursday from Chicago to Philadelphia and New York; has SLEEPING CARS from Chicago to Crestline, and from Pittsburgh to New York, Philadelphia and Baltimore. This train reaches BALTIMORE **Three Hours in Advance of competing Routes!**

THE MAIL Leaves Chicago daily, except Sunday, stopping at all Stations, and reaching Crestline the same evening [where passengers can transfer to Day Express]; leaves Crestline [Express,] the next morning, and leaves Pittsburgh daily, except Sunday. SLEEPING CARS from Pittsburgh to Philadelphia.

THE SOUTHERN EXPRESS Leaves PITTSBURGH daily, except Monday, with SILVER PALACE CARS to Philadelphia and New York; leaves Harrisburg for Baltimore daily, except Sunday.

BOSTON AND NEW ENGLAND PASSENGERS will find this Route especially Desirable, as it Gives them an opportunity of Seeing the FINEST VIEWS AMONG THE ALLEGHANY MOUNTAINS,

Besides Visiting PITTSBURGH, PHILADELPHIA and NEW YORK, without extra cost!

All New England Passengers holding Through Tickets, will be Transferred, with their Baggage, to Rail and Boat Connections in NEW YORK, WITHOUT CHARGE.

Close Connections Made at Lima for all Points on the Dayton & Mich. and Cin., Hamilton & Dayton R'ys,

And at CRESTLINE, for CLEVELAND, ERIE, DUNKIRK, BUFFALO, NIAGARA FALLS, and all Points reached via Lake Shore R.R.

THROUGH TICKETS FOR SALE AT THE COMPANY'S OFFICES, N.W. COR. RANDOLPH & LA SALLE ST.,

65 and 52 Clark St., Cor. Randolph and Wells St., (under the Briggs House,) and at Depot, Chicago; also at Principal Ticket Offices in the West.

F. R. MYERS, Gen. Pass. and Ticket Agt, P. & F. W. R'y, Chicago. W. C. CLELAND, Gen. Western Pass. Agt, P. Ft. W. & C. R'y, Chicago.

T. L. KIMBALL, Gen. Western Pass. Agent, Penn. Central R. R., Chicago.

WHAT IS SAID OF THE RAILROAD GAZETTE.

"A very neat publication in point of appearance, and, as it always has been, is now a reliable, interesting and accurate journal, ably edited in its various departments. * * Our scissors have wandered over its columns "many a time and oft," and always with gratifying results."—*Buffalo Commercial Advertiser.*

"The news is very full, the discussions are conducted in good temper and with excellent information. To judge from this first number, the conductors of the GAZETTE know what "railroading" is, and what a proper weekly journal should be."—*New York World.*

"One of our most valuable exchanges. * * * Its columns teem with reliable information of great benefit to railroad men of every section of the United States."—*Leavenworth Bulletin.*

"Full of information, scientific and general, with regard to railroads all over the country, their construction, operation, etc."—*Rochester Chronicle.*

"For railroad men and others wishing to keep themselves thoroughly posted on railroad matters we know of no better paper."—*Madison State Journal.*

"A most valuable thing to the engineer and all railway men, the capitalist, traveler, mechanic and general reader."—*Brooklyn (N. Y.) Argus.*

"As it devotes much attention to Southern railroad and industrial interests, it is always interesting to Southern readers."—*Galveston News.*

"Has always been one of the best papers of the country for railroad intelligence."—*New York Commercial and Financial Chronicle.*

"In every respect a worthy representative of the energetic and go-ahead city where it is published."—*Cincinnati Railroad Record.*

"Of great interest to railroad men, and almost equally so to those who use railroads."—*Marshall (Mich.) Statesman.*

"Makes a very handsome appearance and is full of valuable matter."—*Chicago Evening Post.*

"Every man who is at all interested in railroads would do well to take the GAZETTE."—*Jacksonville (Ill.) Independent.*

"It appears to be in many features the best journal of its class now extant."—*New York Official Railway News.*

"An impartial and independent journal, valuable to every railroad man."—*Parkersburg (W. Va.) Times.*

"It must prove a very valuable paper to stockholders and those who are interested in railroads."—*New York Globe.*

"Unquestionably the best railroad journal in the United States.—*Waukegan (Ill.) Patriot.*

"The best informed railway newspaper published in the West."—*Aurora (Ill.) Beacon.*

"A well-edited paper, showing industry and intelligence."—*American Railway Times.*

"Well worthy the patronage of all intelligent railroad men."—*Kalamazoo Gazette.*

"Replete with matters connected with railroading."—*Holmesburg (Pa.) Gazette.*

"We regard it as the best railroad paper out."—*Peoria National Democrat.*

"Equal in appearance to any technical journal of America."—*Atchison Patriot.*

"Every railroad man reads the GAZETTE."—*Bloomington (Ill.) Leader.*

"A complete repository of railroad news."—*Harrisburg (Pa.) Patriot.*

"The best journal of its class in the United States."—*LaCrosse Leader.*

"Promising much for the future."—*Detroit Commercial Advertiser.*

"A model of what a railroad newspaper should be."—*Chicago Tribune.*

"An excellent journal for railroad men."—*Mankato (Minn.) Record.*

"Of great interest to railroad men."—*Delaware (O.) Gazette.*

Broad Gauge! Double Track!

ERIE RAILWAY.

4 EXPRESS TRAINS DAILY!

From Cleveland, Dunkirk and Buffalo, 625 Miles, to New York, WITHOUT CHANGE of Coaches!

☞ The Trains of this Railway are run in DIRECT CONNECTION WITH ALL WESTERN AND SOUTHERN LINES, for

Elmira, Williamsport, Oswego, Great Bend, Scranton, Newburgh,

NEW YORK, ALBANY, BOSTON, PROVIDENCE,

AND PRINCIPAL NEW ENGLAND CITIES.

New and Improved DRAWING ROOM COACHES are attached to the DAY EXPRESS Running THROUGH TO NEW YORK.

☞ **SLEEPING COACHES,** Combining all Modern Improvements, with perfect Ventilation and the peculiar arrangements for the comfort of Passengers incident to the **BROAD GAUGE,** accompany all night trains to New York.

CONNECTIONS CERTAIN! as Trains on this Railway will, when necessary, **wait from one to two hours for Western trains.**

All Trains of Saturday run directly Through to New York.

☞ **Ask for Tickets via Erie Railway,** which can be procured at **66 Clark Street,** Chicago, and at all Principal Ticket offices in the West and Southwest.

L. D. RUCKER, Gen'l Superintendent, New York. | **A. J. DAY,** Western Passenger Agent, Chicago. | **WM. R. BARR,** Gen'l Passenger Agent, New York.

LAKE SHORE
—AND—
MICHIGAN SOUTHERN R.W.

THE GREAT THROUGH LINE BETWEEN

CHICAGO, BUFFALO & NEW YORK,

WITHOUT CHANGE!

AND THE ONLY RAILWAY

RUNNING PALACE COACHES THROUGH!

—BETWEEN—

CHICAGO & NEW YORK, via BUFFALO

☞ WITHOUT TRANSFER OF PASSENGERS! ☜

All Trains Stop at Twenty-Second Street to Take and Leave Passengers. Baggage Checked at that Station for all Points East.

4 EXPRESS TRAINS DAILY, [Sundays Excepted,] Leave Chicago from the New Depot, on Van Buren St., at the head of La Salle Street, as follows:

7:30 A. M. MAIL TRAIN. VIA OLD ROAD AND AIR LINE. SUNDAYS EXCEPTED.

Leaves 22d Street 7:45 A. M. Stops at all Stations. **Arrives**—Toledo, 6:20 P. M.

11:30 A. M. SPECIAL NEW YORK EXPRESS, -A AIR LINE. SUNDAYS EXCEPTED.

Leaves—Twenty-Second Street, **11:45 A. M. Arrives**—Elkhart, 3:55 P. M.; Cleveland 10:40 P. M.; Buffalo, 4:10 A. M.: New York, 5:30 P. M.; (Chicago Time) Boston, 11:45 P. M.

This Train has PALACE SLEEPING COACH Attached, Running

THROUGH TO ROCHESTER, WITHOUT CHANGE!

IN DIRECT CONNECTION WITH

Wagner's Celebrated Drawing-Room Coaches on N. Y. Central R. R.

Only Thirty Hours, Chicago to New York!

5:15 P. M. ATLANTIC EXPRESS (Daily), VIA OLD ROAD.

Leave—Twenty-Second Street **5:30 P. M. Arrives**—Laporte, 8:10 P. M. (Stops 20 minutes for Supper): arrives at Toledo, 2:50 A. M.; Cleveland, 7:35 A. M. (30 minutes for Breakfast); arrives at Buffalo, 1:50 P. M.; Rochester, 5:10 P. M. (30 minutes for Supper); connects with **Sleeping Coach running Through from Rochester to Boston Without Change,** making but **One Change between Chicago and Boston.**

NEW AND ELEGANT SLEEPING COACH Attached to this Train, Running THROUGH from CHICAGO TO NEW YORK WITHOUT CHANGE! Arrives at NEW YORK, 6:40 A. M.

9:00 P. M. NIGHT EXPRESS VIA AIR LINE. (DAILY EXCEPT SAT. & SUN.)

Leaves—Twenty-Second Street, **9:15 P. M. Arrives**—Toledo, 6:00 A. M. (20 minutes for Breakfast); arrives at Cleveland, 10:35 A. M.; Buffalo, 5:30 P. M.; New York, 11:00 A. M.; Boston, 3:50 P. M.

KALAMAZOO DIVISION.

Leave Chicago 7:30 A. M. Arrive at Kalamazoo 3:15 P. M.; Grand Rapids, 8:15 P. M.

Leave Chicago 9:00 P. M. Arrive at Kalamazoo 4:40 A. M.; Grand Rapids, 10:00 A. M.

Elkhart Accommodation leaves Chicago, 3:30 P. M. Arrives at Elkhart, 8:20 P. M.

☞ There being no heavy grades to overcome, or mountains to cross, the road bed and track being the smoothest and most perfect of any railway in the United States, this Company run their trains at a high rate of speed with perfect safety.

☞ Travelers who wish to SAVE TIME and make SURE CONNECTIONS, purchase Tickets via

LAKE SHORE & MICHIGAN SOUTHERN R'Y.

THE ONLY LINE RUNNING THROUGH BETWEEN CHICAGO AND BUFFALO, WITHOUT TRANSFER, and in Direct Connection with NEW YORK CENTRAL RAILROAD and ERIE RAILWAY.

General Ticket Office for Chicago, No. 56 Clark Street.

CHAS. F. HATCH, General Superintendent, CLEVELAND, OHIO.

F. E. MORSE, General Western Passenger Agent, CHICAGO.

ILLINOIS CENTRAL RAILROAD.

PASSENGER TRAINS LEAVE CHICAGO FROM THE GREAT CENTRAL DEPOT, FOOT OF LAKE ST

ST. LOUIS AND CHICAGO THROUGH LINE.

9:30 A. M. DAY EXPRESS, Sundays Excepted. Arriving in ST. LOUIS at 10:15 P. M.

☞ This Train Reaches St. Louis ONE HOUR & FIFTEEN MINUTES in Advance of any other Route! ☜

8:30 P. M. FAST LINE. Saturdays Excepted. Arriving at ST. LOUIS at 8:00 A. M.

AT ST. LOUIS, Direct Connections are Made FOR

Jefferson City, Sedalia, Pleasant Hill, Macon, Kansas City,

LEAVENWORTH, ST. JOSEPH & ATCHISON,

—Connecting at KANSAS CITY for—

LAWRENCE, TOPEKA, JUNCTION CITY, SALINA, SHERIDAN, &c.

CAIRO, MEMPHIS AND NEW ORLEANS LINE.

9:30 A. M. CAIRO MAIL, Sundays Excepted. Arriving at **Cairo** 2:20 A. M., **Memphis** 12:40 P. M., **Mobile** 9:40 A. M **Vicksburg** 9:30 A. M., **New Orleans** 11:10 A. M.

8:30 P. M. CAIRO EXPRESS, Except Saturdays. Arriving at **Cairo** 3:15 P. M., **Memphis** 2:30 A. M., **Vicksburg** 5:00 P. M., **New Orleans** 1:30 A. M.

4:45 P. M. CHAMPAIGN PASSENGER, Arriving at **Champaign** at 11:15 P. M.

☞ THIS IS THE ONLY DIRECT ROUTE TO

Humboldt, Corinth, Grand Junction, Little Rock, Selma, Canton, Grenada, Columbus, Meridian, Enterprise,

MEMPHIS, VICKSBURG, NEW ORLEANS & MOBILE.

At NEW ORLEANS, connections are made for

GALVESTON, INDIANOLA,

And all Parts of Texas.

☞ NOTICE.—This Route is from 100 to 150 MILES SHORTER, and from 12 to 24 HOURS QUICKER than any other.

THIS IS ALSO THE ONLY DIRECT ROUTE TO

DECATUR, TERRE HAUTE, VINCENNES & EVANSVILLE.

Peoria and Keokuk Line.

9:30 A. M. KEOKUK PASSENGER, Sun. Excepted. Arriving at **Chenoa** 3:15 P. M., **El Paso** 4:05 P. M., **Peoria** 5:40 P. M., **Canton** 7:14 P. M., **Bushnell** 8:59 P. M., **Keokuk** 11:26 P. M., **Warsaw** 12:05 A. M.

8:30 P. M. KEOKUK PASSENGER, On Saturdays, **This Train will leave at 4:45 P. M.** Arriving at **Chenoa** 3:35 A. M., **El Paso** 4:25 A. M., **Peoria** 6:05 A. M., **Canton** 7:36 A. M., **Bushnell** 9:25 A. M., **Keokuk** 12:05 P. M., **Warsaw** 12:40 P. M.

THIS IS THE DIRECT ROUTE TO

PEORIA, CANTON, KEOKUK, CHATSWORTH, FAIRBURY,

CHENOA, EL PASO, BUSHNELL, HAMILTON, & WARSAW.

Connecting at PEORIA for

PEKIN, HAVANA, BATH AND VIRGINIA.

—CONNECTING AT KEOKUK FOR—

Ottumwa, Eddyville, Oskaloosa, Pella, Monroe, Des Moines.

Elegant Drawing Room Sleeping Cars

ATTACHED TO ALL NIGHT TRAINS.

☞ SPACIOUS AND FINE SALOON CARS, with all Modern Improvements, Run upon all Trains.

BAGGAGE CHECKED THROUGH TO ALL IMPORTANT POINTS.

☞ For Through Tickets, Sleeping Car Berths, Baggage Checks, and information, apply at the office of the Company in the Great Central Depot, foot of Lake St.

Hyde Park and Oakwoods Train.

	Leave.	Arrive.		Leave.	Arrive.
HYDE PARK TRAIN,...	*6:20 A. M.	*7.45 A. M.	HYDE PARK TRAIN,....	*3:00 P. M.	*5:15 P. M.
HYDE PARK TRAIN...	*8:00 A. M.	*9.15 A. M.	HYDE PARK TRAIN,....	*6:10 P. M.	*7:35 P. M.
HYDE PARK TRAIN,..	*12:10 P. M.	*1:50 P. M.			

* Sundays Excepted.

W. P. JOHNSON, Gen. Pass. Agent. **M. HUGHITT, Gen. Supt.**

1870. Great Central Route! 1870.

SPEED! COMFORT! SAFETY!

MICHIGAN CENTRAL and GREAT WESTERN RAILWAYS!

The Great Central Route, via Niagara Falls, to

NEW YORK AND NEW ENGLAND.

Pullman's Magnificent Palace Drawing-Room Cars,

— FROM —

CHICAGO TO NEW YORK CITY, WITHOUT CHANGE.

4 PASSENGER TRAINS LEAVE CHICAGO, DAILY EXCEPT SUNDAY.
(DEPOT, FOOT OF LAKE STREET,) as Follows:

5:00 A. M. (SUNDAYS EXCEPTED.) MAIL TRAIN. Stops at all Stations.
Arrives DETROIT at 5:40 P. M.

11:30 A. M. (SUNDAYS EXCEPTED.) SPECIAL NEW YORK & BOSTON EXP.
Arrives at Michigan City 1:18 P.M.; New Buffalo 1:32, Niles 2:15, [Dinner], Kalamazoo 3:53 P. M.; Battle Creek 4:28, Marshall 4:48, Jackson 5:45, Detroit 7:55, London 12:05, A. M. Hamilton 2:35 A. M.; Toronto 9.30, Suspension Bridge 3:55, Rochester 7:00 A. M.; Albany, 2:00 P. M.; NEW YORK, 6:25, BOSTON, 11:50 P. M. ☞ This train connects at ROCHESTER (7:00 A. M.) with

Wagner's Magnificent Palace Drawing-Room Cars!

☞ RUNNING THROUGH TO NEW YORK, WITHOUT CHANGE! ☜

5:15 P. M. (DAILY.) ATLANTIC EXPRESS.
Arrives at Michigan City, 7:18 P. M.; Niles 8:30 P. M. [Supper]; Kalamazoo, 10:25 P. M.; Jackson, 1:00 A. M.; Detroit 3:40, London, 8:35, [Breakfast]; Hamilton 11:40, Suspension Bridge 1:30 P. M.; Rochester 5:00 P. M.; Albany, 1:30 A. M.; NEW YORK, 6:40 A. M.; BOSTON, 11:00 A. M.
A MAGNIFICENT DRAWING-ROOM SLEEPING CAR is attached to this train daily, FROM CHICAGO TO NEW YORK CITY. The celebrated

☞ **Hotel Drawing-Room Car is also attached to this Train from Chicago to Rochester!** ☜

☞ These, together with **ELEGANT DAY CARS TO SUSPENSION BRIDGE,** make this Train the favorite Train for all points East.

SPECIAL NOTICE.—Boston and New England Passengers will please notice that this Train now makes direct connection through. A SLEEPING CAR is attached at Rochester at 5.20 P. M., running through to Springfield, Mass., thus avoiding transfer at Albany. Breakfast at Springfield. This Train reaches Springfield early enough second morning to **Connect with all Trains** up and down the Connecticut.

9:00 P. M. (SAT. & SUN. EXCEPTED). NIGHT EXPRESS.
Arrives at Michigan City, 11:03 P. M.; Niles, 12:25 A. M.; Kalamazoo, 2:00; Marshall, 3:12; Jackson, 4:25; Grand Trunk Junction, 7:00; Detroit, 7:30; London, 1:45 P. M.; Hamilton, 4:35; Toronto, 9:35; Niagara Falls, 6:15; Buffalo, 7:15 P. M.; Rochester, 9:10; Syracuse, 12:25 A. M.; Rome, 1:55; Utica, 2:35 Albany, 6:30 A. M.; NEW YORK, 10:00 A. M.; BOSTON, 3:40 P. M.

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And from Suspension Bridge to New York.

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☞ FOR THROUGH TICKETS, and any and all information, Sleeping Car accommodations, &c., apply at General Office in Tremont House Block, at office in Great Central Depot; also at No. 60 Clark street, under Sherman House; at Grand Trunk Railway Office, 48 Clark street, or at New York Central Railroad Office, No. 53 Clark street, and at office under Briggs House.

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4:30 P. M. (EXCEPT SATURDAY.) AFTERNOON EXPRESS.
Arriving at Michigan City 6:20 P. M. [Supper]; LaFayette, 11:30 P. M. Indianapolis, 2:15 A. M.; Louisville, 7:00 A. M.; Nashville, 4 00 P. M.

A GOOD SLEEPING CAR is Attached to this Train Every Night,
And goes from Chicago to Louisville WITHOUT CHANGE!

☞ **SPECIAL NOTICE.**—This Train stops at Michigan City for Supper, and waits at that point for Michigan Central Atlantic Express East, leaving Chicago at 4:45 p. m. Passengers going South, and wishing as much time in Chicago as possible, can take the 4:45 p. m. Michigan Central Atlantic Express, and connect without fail at Michigan City, with above Through Louisville Express.

☞ **THE GREAT BRIDGE ACROSS THE OHIO** at Louisville being completed, passengers are relieved of the omnibus transfer.

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Michigan Central R. R.

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5:00 A. M. AND **4:30** P. M. **Trains from Chicago Connect at New Buffalo.**

Kalamazoo, Allegan & Grand Rapids R. R.

Open to Grand Rapids.

11:30 A. M. AND **9:00** P. M. **Trains from Chicago Connect at Kalamazoo.**

Peninsular Railroad of Michigan.

Open to Charlotte.

5:00 A. M. AND **9:00** P. M. **Trains from Chicago Connect at Battle Creek.**

Jackson, Lansing & Saginaw Railroad.

Open to Bay City, Mich. Passing through Lansing and Saginaw.

5:00 A. M. AND **9:00** P. M. **Trains from Chicago Connect at Jackson.**

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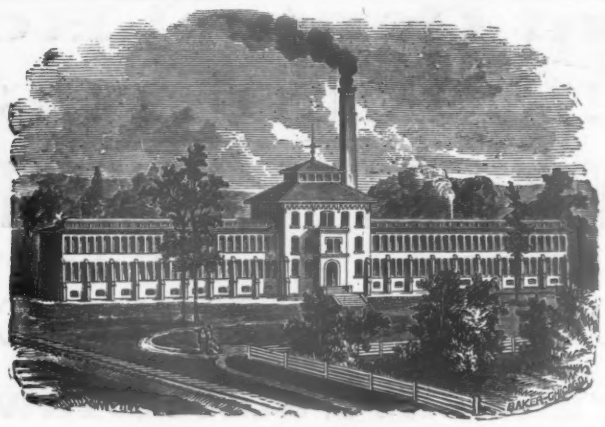

Elgin Watches!

MANUFACTURED BY

THE NATIONAL WATCH COMP'Y.

OFFICE GEN'L SUP'T U. P. R. R. }
OMAHA, Neb., Dec. 16, 1869. }

HON. T. M. AVERY, President National Watch Co., Chicago, Ill.

Dear Sir—During the months that I have carried one of your B. W. Raymond Watches, it has not failed to keep the time with so much accuracy as to leave nothing to desire in this regard.

For accuracy in time keeping, beauty of movement and finish, your watches challenge my admiration and arouse my pride as an American, and I am confident that in all respects they will compete successfully in the markets of the world with similar manufactures of older nations. They need only to be known to be appreciated.

Yours, most respectfully,
C. G. HAMMOND, Gen. Supt.

OFFICE OF GEN'L SUP'T H. R. R. R. }
NEW YORK, Jan. 17, 1870. }

M. AVERY, Esq., President National Watch Co.,

Dear Sir—The Watch made by your Company, which I have carried the past two months, has kept excellent time. I have carried it frequently on engines, and have been on the road with it almost daily. During this time it has run uniformly with our standard clock. Truly yours,
J. M. TOUCEY.

PENN'A R. R. CO., GEN. SUP'T. OFFICE, }
ALTOONA, Jan. 19, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago:

Dear Sir—This Company has purchased and put in the hands of its engine-men, eighty "Raymond movements;" which have given excellent satisfaction and proved to be very reliable time-keepers. In addition to these, quite a number of Elgin Watches have been purchased by officers and employes of this Company, all of whom have been well pleased with the efficiency and regularity of the movements manufactured by the National Watch Company. Respectfully,
EDWARD H. WILLIAMS,
General Superintendent.

AMERICAN MERCHANTS' UNION EXPRESS CO. }
CHICAGO, Feb. 17, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago, Ill.:

Dear Sir—It gives me pleasure to state that the two or three Elgin Watches I have at different times purchased for presentation have given entire satisfaction, and are highly valued as elegant and correct time-keepers.

A very large number of your Watches are being carried by the Messengers in the employ of this Company, and are giving entire satisfaction, their time-keeping qualities being implicitly relied upon.
CHAS. FARGO.

MICHIGAN CENTRAL R. R CO. }
CHICAGO, Jan. 15, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have now been carrying one of your Elgin Watches, of the B. W. Raymond pattern, for nearly five months, and it affords me much pleasure to testify in favor of its time-keeping qualities, in which, after this length of time, I have great confidence. It has from the first run very close to the standard time, the slight variation being uniform, and susceptible of correction by careful regulation. My experience thus far justifies the opinion that it is a *very safe and reliable* time-keeper.

Respectfully yours, H. E. SARGENT.

OFFICE OF THE GEN. SUP'T. C. & N. W. R'Y, }
CHICAGO, Feb. 16, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have pleasure in expressing my opinion of the Elgin Watches, the more so since I do not think there is a better watch made. A large number of them are in use by our conductors and engineers, and other employes, and I have heard no dissenting opinion upon their merits. They run with a smoothness and uniformity fully equal to any other watch I know of, and justify all your claims of excellence in manufacture and fitting of parts. Yours, truly,
GEO. L. DUNLAP, Gen'l Sup't.

LAKE SHORE & MICHIGAN SOUTHERN R. R. }
CHICAGO, Jan. 27, 1870. }

T. M. AVERY, Esq., President National Watch Co.:

Dear Sir—I have carried the Elgin Watch long enough to be able to pronounce it a first-rate time-keeper. I am making a very careful test of its performance and will soon give you the results. I think it will show that the West can produce Watches equal to to the manufacture of any part of the world. Yours, truly,
E. B. PHILLIPS,
President L. S. & M. S. R. R. Co.

OFFICE GEN. SUP'T ERIE RAILWAY, }
NEW YORK, Feb. 7, 1870. }

T. M. AVERY, Esq., President National Watch Co., Chicago, Ill.:

Dear Sir—Having for about three months tested, in various ways, the "time-keeping" qualities of one of your Elgin Watches, I most cheerfully award it the praise that it is due. For one month the Watch was carried by one of our Locomotive Engineers, and since by different persons, so that its full value as a time-keeper could be known under different modes of treatment. I will simply say that it has given *perfect* satisfaction, and in my opinion is as near perfection as I believe it possible a Watch can be made.
Respectfully yours,
L. H. RUCKER,
General Superintendent.

☞ No Movements Retailed by the Company. } Business Office and Salesroom of the National Watch Company, Nos. 159 and 161 Lake Street, Chicago.

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